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STUDY OF THE ECONOMIC IMPACT OF SULFUR REGULATIONS PROMULGATED BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY FOR OHIO ON AUGUST 27, 1976

STUDY DOCUMENT NUMBER 8. COST ESTIMATES OF VARIOUS SULFUR DIOXIDE STRATEGIES FOR SELECTED OHIO UTILITY POWER PLANTS

PEDCo-Environmental Specialists, Incorporated,
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16. ABSTRACT

This report is the eighth volume in support of the Inflation Impact Statement for sulfur dioxide regulations prepared by the U.S. Environmental Protection Agency, to correct deficiencies in the Ohio State Implementation Plan. The Technical Support Document, Volumes I and II may be obtained through the National Technical Information Service - EPA 905/2-76-002, PB-257 694 and PB-257 695.

This document provides basic data on pollution control alternatives and their costs for utilities, including plant specific parameters which influence costs, identification of components included in capital and operating cost estimates, alternative methods of control, and procedures by which costs for each method are determined.

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COST ESTIMATES OF VARIOUS SULFUR DIOXIDE STRATEGIES FOR SELECTED OHIO UTILITY POWER PLANTS

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INFLATION IMPACT STUDY DOCUMENTATION

This appendix identifies the documents prepared to support the Inflation Impact Analysis of the sulfur oxide regulations prepared by the U.S. Environmental Protection Agency (EPA) for the state of Ohio.

Figure 1 identifies the supporting documents. Document #2 provides an overview of the study methodology and illustrates the depth of analysis contained in the study.

Impact Studies

Documents #3 and 4 are economic impact analyses of the utility and industrial sectors in Ohio. These reports address impacts on prices, output, employment and financial viability. Document #5 summarizes the energy impacts of the regulation in terms of the level of energy demand, shifts from coal to oil likely to occur as a result of compliance with the regulations as well as shifts in coal production patterns. In particular, this report focuses on whether coal production in Ohio, which is generally high in sulfur content, will be adversely impacted.

Cost Minimization

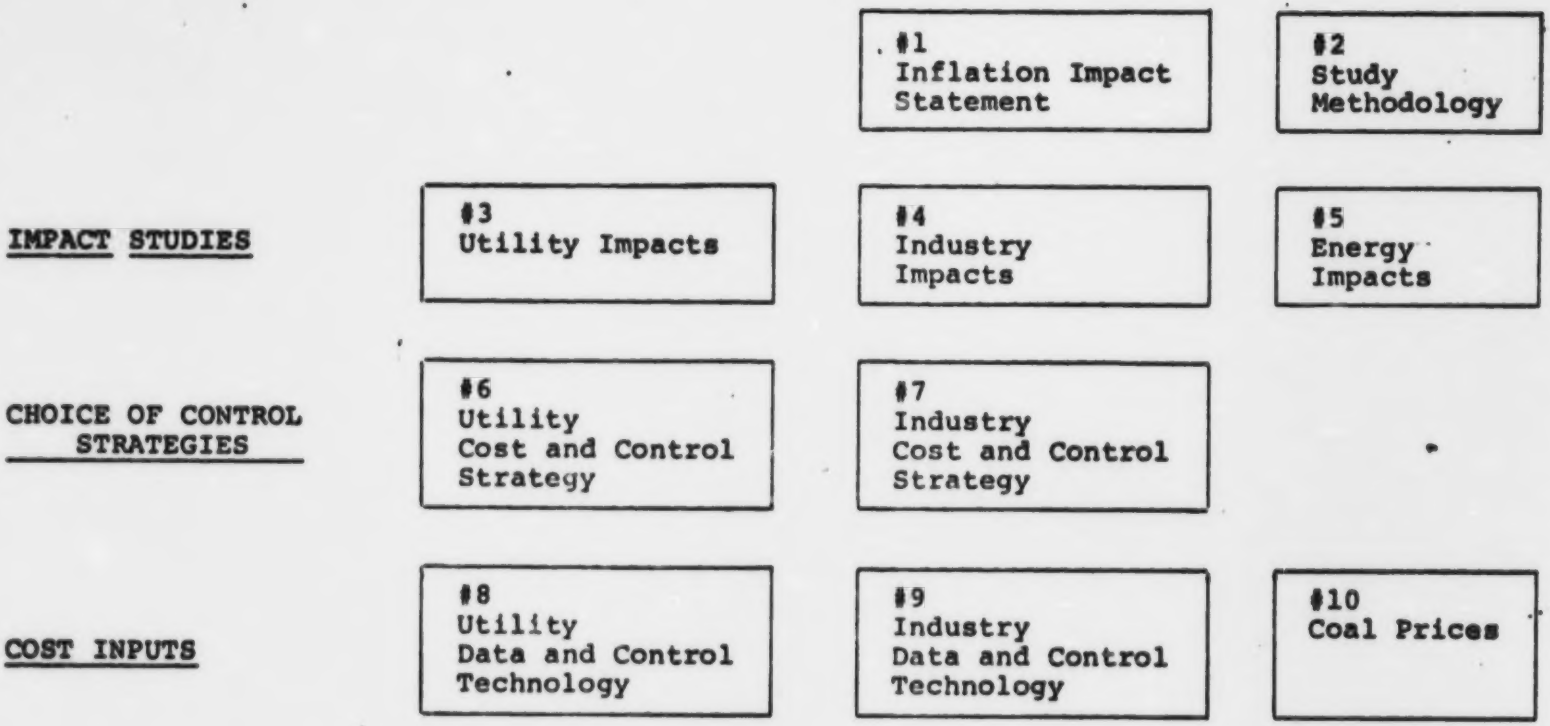
Documents #6 and 7 present the methodology for estimating costs of compliance and the choice of pollution control strategies. For both utility and industry, these supporting documents outline the cost minimizing strategies which provide the basis for the economic and energy impacts discussed in documents #3 - 5.

Cost Inputs

These final documents contain the basic data inputs to the study. Document #8 describes the pollution control technology options, their costs plus basic plant specific parameters which influence costs such as fuel consumption and boiler firing rates.

Figure 1

INFLATION IMPACT STATEMENTS SUPPORTING DOCUMENTS



Document #9 contains similar data on the industrial sector. Document #10 presents the derivation of coal prices employed in this study and used in both the industry and utility sector analysis. The focus is on the price premium of low versus high sulfur coal.

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The PEDCo Project Director was Timothy W. Devitt. Norman J. Kulujian was Project Manager. Technical support and analyses were provided by Messrs. David Noe, Larry Gibbs, and Ronald Kell.

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1.0 INTRODUCTION

This report provides estimates of capital and operating costs of several methods reducing SO_2 emissions specifically for application to 34 Ohio power plants. Schedules for achieving compliance with particulate and SO_2 regulations at these power plants are also presented. Although many assumptions were required in this study, the data are considered valid for comparison of costs of the several control methods.

Section 2 identifies the components included in the estimates of capital and operating costs, lists the control methods for which costs are assessed, and the power plants to be evaluated, and briefly discusses the criteria for determining degree of emission reduction required for each plant.

Section 3 discusses the several alternative methods of SO_2 control and the procedures by which costs for each method are determined. Capital and operating costs are presented in Section 4 for the various SO_2 control alternatives.

2.0 SUMMARY OF COST METHODOLOGY

2.1 COST DEFINITIONS

The U.S. Environmental Protection Agency requested an evaluation of capital and annualized costs of various SO_2 control methods for application to selected Ohio power plants. The estimated costs are tabulated in Section 4 for each plant and also for individual stacks serving the plant. The costs reported are in January 1976 dollars.

Capital costs entail direct and indirect components. Direct costs are those of plant equipment, instrumentation, piping, electrical and structural materials, site work, insulation, painting, pilings, and the accompanying costs of installation or application. Indirect costs include interest assessed during construction; contractors fees and expenses; engineering, freight, and off-site expenses; and taxes and allowances for contingencies.

Annualized costs are both variables and fixed. In this analysis, only a portion of the variable costs are considered: costs of labor, maintenance, and overhead are included; annual utility costs are omitted. The client also required omission of fixed costs, consisting of depreciation, taxes, insurance, and capital charges.

Energy is required to implement a specific control method. The power may be obtained either from within the system being controlled or from an outside source. Capital cost of this power, defined as a capacity penalty or a derate factor is the percentage of the total plant generating capacity required to operate the power plant with the specific control system. The fuels needed to operate the various control systems are segregated from the other annualized costs.

2.2 SO_2 CONTROL METHODS

The SO_2 control methods considered in this study are shown in Table 2-1. Two flue gas desulfurization (FGD) systems are evaluated. The wet limestone system, representing a nonregenerable process, has demonstrated relatively high collection efficiency and reliability. The Wellman-Lord system, currently in operation on several power plant boilers, is considered as representative of regenerable control systems.

The next three methods of reducing SO_2 emissions are based on reducing sulfur content of the coal fired to the boilers, either by burning low-sulfur coal transported to Ohio from the regions where it is mined, by blending low-sulfur coal with the current coal supplies, or by removing pyritic sulfur from the current coal supplies (coal cleaning).

Table 2-1. PROPOSED SO_2 CONTROL METHODS

Method	Subgroup
Flue gas desulfurization	Nonregenerable wet limestone Regenerable Wellman-Lord
Low-sulfur coal	Western low-Btu Western high-Btu Eastern
Coal blending	Western low-Btu Western high-Btu Eastern
Coal cleaning	1.6 sp. gr. washability 1.3 sp. gr. washability
Phaseout	Capacity factor Age
Tall stacks	Generic

Although low-sulfur coal is available from many parts of the country classification as "eastern" and "western" coals is sufficient for this study. The western low-sulfur coals, however, must be further categorized as "high-Btu" and "low-Btu" coals because of significant differences in heating values.

Coal blending entails the mixing of low-sulfur coal with normal supplies in the proportions required for compliance with a specific SO_2 emission regulation. The same categories of low-sulfur coals are considered for coal blending.

Coal cleaning processes can be categorized as physical and chemical. The physical processes evaluated for this study include heavy-media cyclones and deister tables, froth flotation equipment, and water clarifiers. The degree of pyritic sulfur removal is influenced by the separation or specific gravity level of cleaning. Two levels of sulfur removal, at specific gravities of 1.3 and 1.6, are assumed.

Power plants considered as candidates for phase-out are identified on the basis of age and capacity factor. No costs associated with phase-out are calculated.

Capital costs for the tall stack option are not calculated for individual stacks. Stack costs are presented as a function of stack diameter for four stack heights ranging

from 500 to 1200 feet. Stack diameters for specific boiler units can be obtained if the tall stack option is to be considered as an SO_2 control alternative.

2.3 DATA ACQUISITION

After identification of the boiler and control system parameters required to calculate costs for each control method a data form was prepared for each plant. PEDCo staff visited offices of the Ohio Environmental Protection Agency (OEPA) and EPA Region V to review state air permit applications, Federal Power Commission forms, responses of utilities to 114 letters, and records of public hearings. When two sources of information gave different data, the most recent values were used in the cost analysis.

Table 2-2 lists the power plants to be evaluated in the study. The available data for several plants (mainly municipal utility systems) were inadequate, and costs for these power plants were assumed by using costs from other systems having similar characteristics. The plants not evaluated are listed in Table 2-3.

2.4 SULFUR DIOXIDE EMISSION LEVELS

Cost analyses are based on compliance with proposed regulations on SO_2 emissions as given in an EPA Technical Support Document dated September 1975.* Costs are calcu-

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* The proposed regulations appearing in the November 10, 1975 Federal Register (40 CRF Part 52) differ from those in the Technical Support Document. The differences will not affect the project goals, since a matrix of costs is required for each power plant stack.

Table 2-2. POWER PLANTS INCLUDED IN COST EVALUATION

• Acme	• Mad River
• Ashtabula	• Miami Fort
• Avon Lake	• Muskingum River
• Bayshore	• Niles
• Beckjord	• Norwalk
• Burger	• Orrville Municipal
• Cardinal	• Painesville Municipal
• Cleveland Municipal	• Philo
• Conesville	• Picway
• East Lake	• Piqua
• Edgewater	• Poston
• Gavin	• Sammis
• Gorge	• Stuart
• Hamilton Municipal	• Tait
• Kyger Creek	• Tidd
• Lake Shore	• Toronto
	• Woodcock

Table 2-3. UNITS NOT INCLUDED IN COST ASSESSMENT

Plant	Stack	Boilers	Reason
Acme	2	9,10	Packaged units-oil
Acme	3	11,12	Packaged units-oil
Mad River	Entire	plant	In compliance - oil
Miami Fort	2	3-1,3-2	In compliance - oil
Tait	1	7-1,7-2	Just in compliance 1.0% coal,
Tait	2	8-1,8-2	small boilers
Ashtabula	1	1,2	In compliance - oil
Ashtabula	2	3,4	In compliance - oil
Ashtabula	3	5,6	In compliance - oil
Norwalk	1	1	In compliance - oil
Norwalk	2	2,3	In compliance - oil
Hutchings	Entire	plant	Close to compliance

lated for the amount of SO_2 reduction required to meet the proposed regulation and also for two intermediate levels of reduction representing about one-third and two-thirds of the numerical difference (lb SO_2/MM Btu) between current emissions and the proposed emission limit. When the difference between the current emission and proposed limit is less than 1.2 lb SO_2/MM Btu, the following criteria are applied:

- If the difference between current emissions and the proposed limit is between 0.60 and 1.19 lb/MM Btu, costs are computed for the proposed limit and 0.3 lb/MM Btu less than that value.
- If the difference is less than 0.60 lb/MM Btu, costs are computed for the proposed limit.
- Costs are omitted when the difference is less than 0.3 lb/MM Btu.

2.5 EFFECT OF FUEL VARIABILITY ON AVERAGING TIME FOR EMISSION LIMITATIONS

The proposed Ohio sulfur dioxide regulations do not stipulate on averaging time for SO_2 limitations. The cost analysis in this study was based on coal and oil data on an annual basis without accounting for fuel variability.

This section provides coal variability data for different averaging times. The data is based on coal samples taken daily over a seven month period. The standard deviation of an individual value was found to be 29.4 percent. (For example, a coal with an overall average of 3.00 lb $SO_2/10^6$ Btu would have a standard deviation of 0.86 lb $SO_2/10^6$ Btu).

Based on all of the data in the seven month coal analysis, the long term average was calculated to be 4 percent on either side of the mean for 95 percent confidence limits. (Hence, for the coal with a 3.00 lb $SO_2/10^6$ Btu emission value, the chance, with 95 percent confidence, is that the long range emissions will fall between 2.88 and 3.12 lb $SO_2/10^6$ Btu).

Monthly and daily variabilities display as expected, a wider range than long term values. These values in addition to the long term values are shown below for a coal with a 3.00 lb $SO_2/10^6$ Btu emission level.

Interval	Long Term Average lb/MM BTU	Standard Deviation	$S_{\bar{x}} = \frac{\text{Std. Dev.}}{\sqrt{\text{No. of days}}}$	$t_{95\%\ conf}$	Emission Range lb/MM BTU
Long Term (220 days)	3.0	0.86	$0.85/\sqrt{220} = 0.058$	2	2.88 - 3.12
Monthly	3.0	0.86	$0.86/\sqrt{30} = 0.157$	1.96	2.69 - 3.31
Daily	3.0	0.86	Not Applicable; assume log normal distribution with 95% confidence limits: antilog [ln 3.00 $\pm$ 2.83 (ln 1.29)]		1.46 - 6.18

From the data base, there is an 8 percent range in SO_2 emissions over a long term (e.g., annually), 21 percent range in SO_2 emissions using a monthly average, and a 157 percent range in SO_2 emissions using a daily average. It is evident that the proposed Ohio sulfur dioxide regulation, if contingent on short term averages, would significantly increase the costs of control alternatives for achieving compliance.

3.0 CALCULATION PROCEDURE

This section presents a brief discussion of the procedures followed in calculating costs of the various control methods.

3.1 FLUE GAS DESULFURIZATION (FGD)

The process designs assumed for the wet limestone and Wellman-Lord systems are based on review of process designs used or proposed for use at various installations and on discussions with control system manufacturers. Typical process flow sheets for the two systems are shown in Figures 3-1 and 3-2. For purposes of this study, the plants are assumed to be meeting particulate emission rate limitations and thus not to require additional particulate control. The major design parameters are listed below:

- boiler rated capacity
- boiler capacity factor
- coal characteristics (heating value, sulfur and ash content)
- flue gas rate
- flue gas temperature and pressure
- average inlet SO_2 concentration
- outlet SO_2 concentration (at three levels of cost analyses)

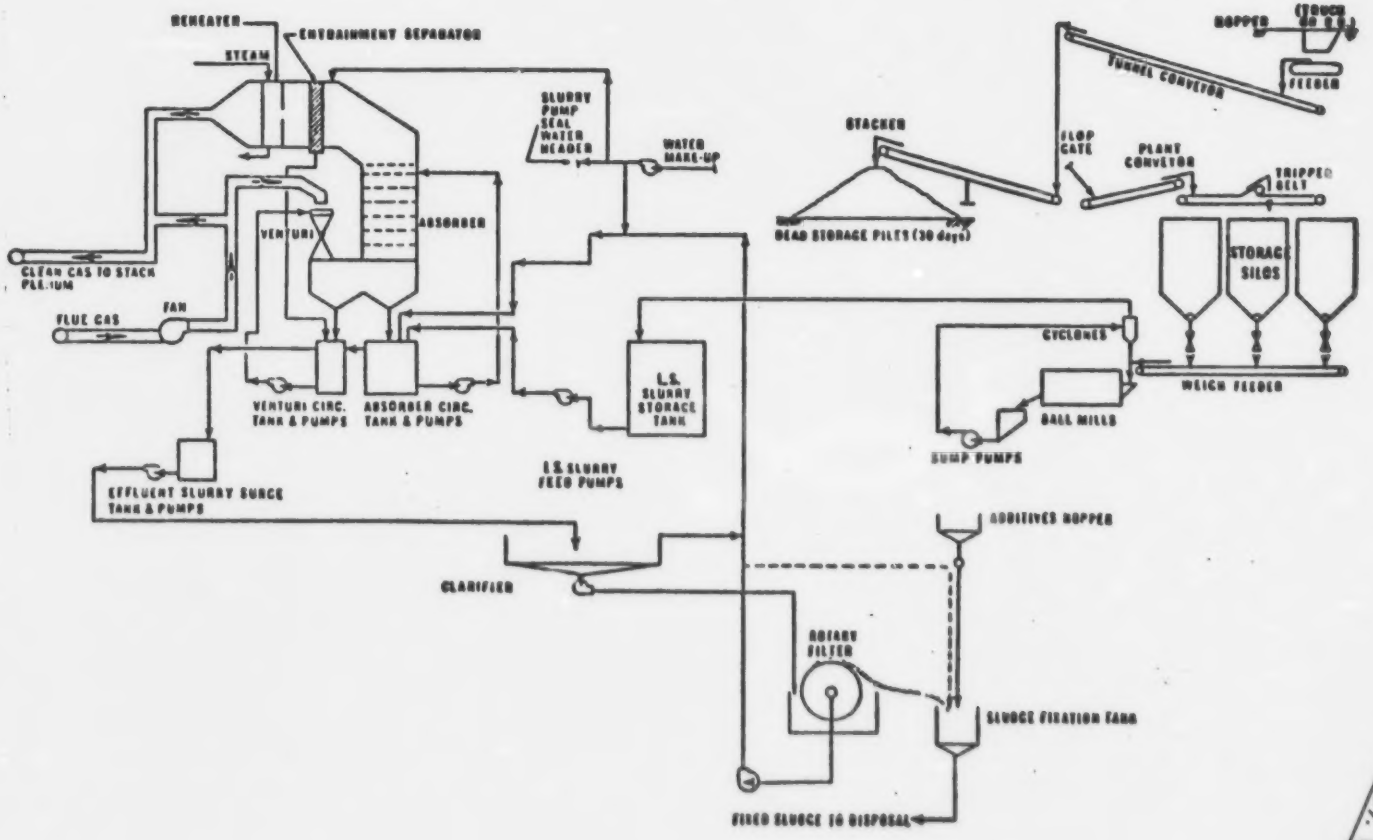

Figure 3-1. Typical process flow sheet of wet limestone FGD system.

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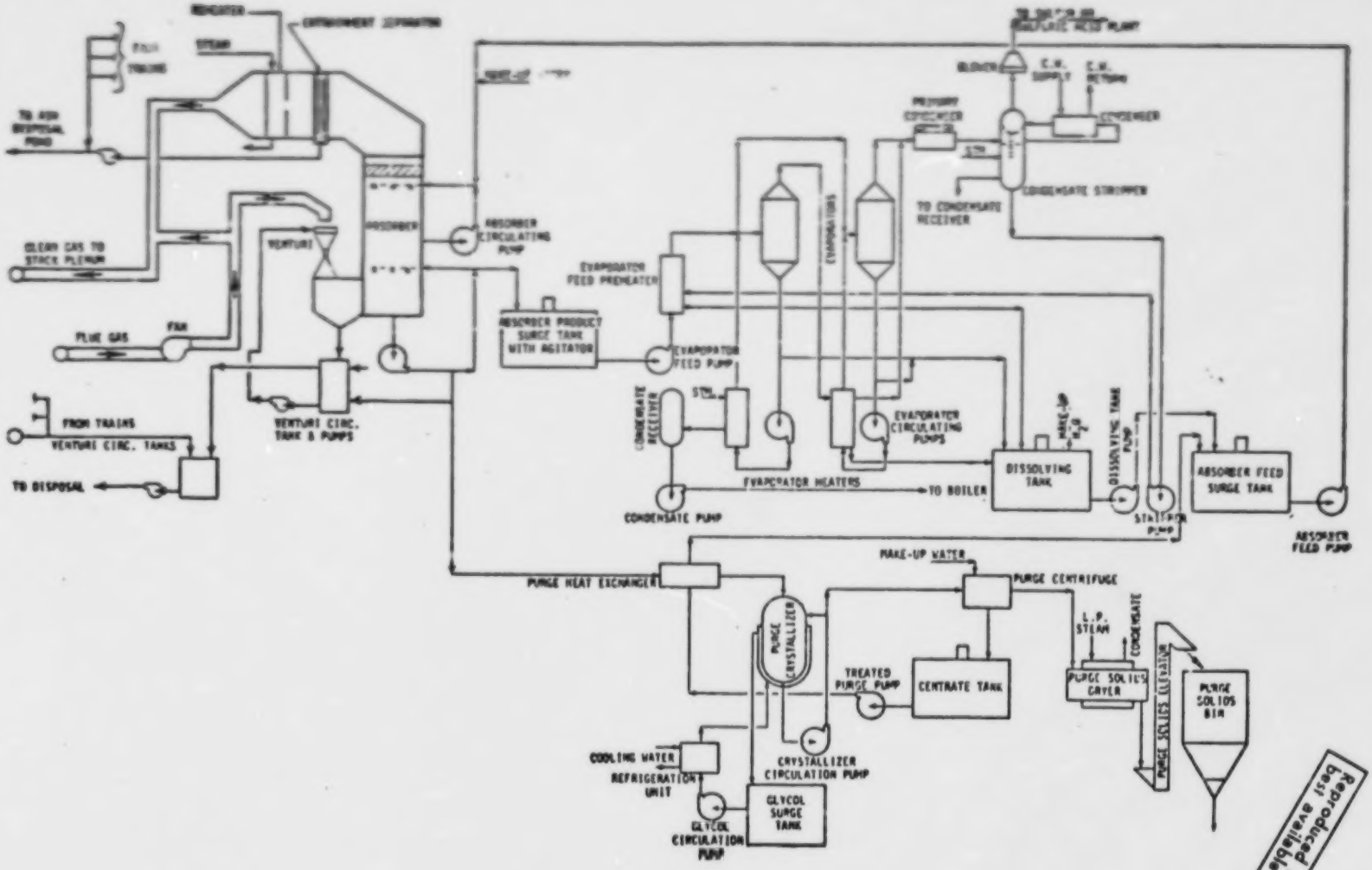

Figure 3-2. Typical process flow sheet of Wellman-Lord FGD system.

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- limestone consumption for nonregenerable system (130% stochiometric)
- soda ash make-up for regenerable system (5% of stoichiometric requirement)

The costs for the systems are calculated by a computer program developed by PEDCo-Environmental Specialists, Inc. Costs for the limestone/soda ash system, scrubbing module, entrainment separator, purge treatment unit, Wellman-Lord regeneration system, and reheater costs are based on specific design and sizing requirements. The design rationale used in this report is discussed in Appendix A.

SO_2 emissions are derived from values in AP-42* based on the sulfur content of the coal. The FGD absorbers are assumed to remove 85 percent of the SO_2 in the gas stream. If a unit requires less than this amount of control, the amount of flue gas treated by the absorbers is adjusted to achieve the required removal level, and the remaining flue gas is assumed to bypass the absorbers. Treated and untreated portions of the flue gas are assumed to be combined and sent to a stack.

For plants where plant layouts were unavailable, a total duct run of 600 feet was assumed; ducting width and height are defined by flue gas volume by assuming a flue gas velocity of 30 ft/sec through the duct.

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* Compilation of Air Pollutant Emission Factors, Research Triangle Park, U.S. EPA Publication Number AP-42, March 1975.

Utility usage figures were tabulated by the PEDCo FGD computer program on a yearly basis. Although the utility rates were zeroed, the usage figures are still reported and are used to compute the fuel and capacity penalties.

The capital costs presented here for both FGD systems reflect the direct installed costs of capital equipment for raw material preparation, SO_2 scrubbing, by-product handling or disposal, and storage. Capital costs do not include the costs of particulate removal equipment. Indirect costs such as interest, field overhead, contractors fees, engineering, freight, offsite, spares, and plant shakedown are included in capital costs as a fixed percentage of direct costs. Taxes are not included. Capital costs also include a contingency, assumed as 20 percent of the direct and indirect costs.

The annual costs presented here for both FGD systems reflect the yearly operating costs of raw materials, labor and supervision, maintenance, and plant overhead. They do not include the costs for utilities (water, steam, electricity) to operate the FGD systems, nor do they include fixed costs (depreciation, interim replacement, insurance, taxes, capital costs). Annual costs for the Wellman-Lord system include credits for sulfuric acid and salt cake as saleable process by-products.

The capacity penalty results from water and electricity within being used in the FGD system. It is a measure of the energy that must be bought or produced to maintain the capacity at which the utility operated before installation of the FGD. The penalty is calculated from annual consumption of water and electricity. Water consumption for cooling and process water is converted to the required energy and added to the electricity needed to run the FGD system; this sum is then divided by the total rated energy of the stack or plant.

Similarly, the fuel penalty results from use of fuel to produce steam for use in the FGD system. The penalty is calculated from computer program annualized usage figures; steam usage is converted into kilowatts, assuming a 50 percent conversion efficiency, and that value is divided by the total rated kilowatts of the stack or plant.

3.2 LOW-SULFUR COAL

Sources of naturally occurring low-sulfur coal are anthracite, low-sulfur western bituminous, and low-sulfur eastern bituminous coal. Except for anthracite coal, which is difficult to burn in systems designed for bituminous coal, eastern utilities encounter no major furnace or boiler problems when switching to a low-sulfur eastern coal.

The most abundant source of low-sulfur fuel is western subbituminous coal. Most of the reserves of this coal are sufficiently low in sulfur and high in heat content for use as an acceptable low-sulfur fuel by current definitions. Western subbituminous coal is found chiefly in Wyoming and Montana. Sulfur content ranges from 0.3 to 1.5 percent, and heat content from 8000 to 12,500 Btu/lb.

In conversion of a steam-generating unit from one source of coal to another, the physical and chemical properties of the coal are of particular interest with respect to operating characteristics. Analysis of coal samples forms the basis for judgment and engineering calculations. Conversion from one type of coal to another usually causes significant changes in operating characteristics only when the physical and chemical properties of the coals differ greatly. Some of the possible effects of coal properties on boilers and other plant equipment are listed below:

1. The quantity of fuel required to sustain a given output depends on heating value. Converting to western fuels generally requires use of more coal and may require additional pulverizer and primary air system capability.

2. Boiler efficiency is related to the moisture content and heating value of the fuel and to changes in weight of the gas produced by combustion. Converting to western coal generally reduces furnace/boiler efficiency.

3. Coals with high moisture content and low heating value produce heavy flue gas resulting in increased gas velocity and loss of draft in the convection passes. Fan power and capacity requirements will also be higher.

4. Superheater steam temperatures increase with increases in flue gas weight and temperature. Boilers with radiant superheaters in the furnace and convection superheaters in the gas pass are affected by conversion to coals that produce more furnace slagging by reduction of heat absorption in the lower furnace and increase of heat absorption in the upper furnace. Higher steam temperatures and metal temperatures occur in both radiant and convection superheaters, with a corresponding increase in steam temperature control duty. Adjustment to heating surface may be required.

6. Additional facilities for handling and storage of fuel and ash may be required if tonnages are significantly different from those now handled.

Numerous studies indicate the adverse effect of low-sulfur coals on ESP performance, due primarily to the increased resistivity of the fly ash. High fly ash resistivity limits the power input to the electrostatic precipitator and hence the driving force for particle capture.

The efficiency of a precipitator can easily drop from about 98 percent on a 2.5 percent sulfur coal to below 90 percent on a 1 percent sulfur coal. The extent of the efficiency degradation is highly variable, however, depending in large part upon the plate area of the installed precipitator and the plate rapping efficiency. Operators may use several methods to overcome this performance degradation:

- Installing flue gas and fly ash conditioning equipment.
- Increasing the plate area.
- Operating the precipitator at higher or lower temperatures.
- Derating the boiler.

Three basic types of low-sulfur coal were analyzed for the SO_2 cost assessment. The coal types and characteristics are summarized in Table 3-1.

Table 3-1. ANALYSES OF LOW-SULFUR COALS

Coal type	Heating value Btu/lb	Sulfur content %	Ash content %
Western low-Btu	8,150	0.5	7.0
Western high-Btu	12,300	0.5	8.0
Eastern	12,500	1.0	13.0

The capital cost elements for Western low-Btu low-sulfur coal include those for upgrading the electrostatic precipitator and for modifying the boiler. Upgrading the ESP involves additional plate area, ash handling equipment, and ducting as needed to comply with particulate regulations while firing the new low-Btu western coal. Boiler modifications include soot blowers, pulverizers, fans, and air heaters as required to minimize derating of the boiler.

Values assigned to boiler derating are based on the electricity requied for new equipment associated with burning low-sulfur coal. Capacity loss due to higher volumes

of flue gas, and slagging and fouling due to Western coal Properties are also a portion of boiler derate costs. ESP derate costs are based on difference in the electricity demand for an ESP meeting particulate regulation with current coal supplies and the demand required for burning low-Btu Western coal.

Annual costs associated with the boiler and ESP modifications are presented individually. The annual costs exclude utilities and fixed costs, but include operating, maintenance, and overhead costs incurred in the coal switch.

The only capital cost element for use of high-Btu Western coal and Eastern coal is for upgrading the ESP. Since analyses of the average Eastern and high-Btu Western coals show essentially the same heating value, moisture content, and fouling characteristics as those of the current coal supply, boiler modification costs are assumed to be negligible. Boiler and ESP derate values associated with high-Btu Western coals are calculated similarly to those for Western low-Btu coal. Boiler derate is based solely on higher slagging characteristics of the high-Btu Western coal supply.

Annual costs for modification of the boiler and ESP are negligible for Western high-Btu and Eastern coals. ESP upgrade costs exclude the cost for utilities and fixed costs. Annual costs include operating, maintenance, and

overhead costs incurred in the switch to high Btu Western coal.

For Eastern low-sulfur coal, boiler derate is considered to be zero since the coal analyses reveal better combustion characteristics than those of the current coals, which tend to cause slagging.

3.3 COAL BLENDING

Coal blending to meet SO_2 emission limits is advantageous in that present supplies of coal can be used to some extent. The present coal is blended with a coal of low sulfur content in proportions yielding an average sulfur content that will achieve compliance.

Coal blending is based on a mixing of the two coals at the crusher house. Required facilities include separate coal storage piles, in-ground hoppers, scales, conveyors, and accessories. For cost estimates, it is assumed that the plant can provide enough space for the additional low-sulfur coal storage pile and that 300 feet of conveyor from the pile to the crusher house is required.

The low-sulfur coals evaluated for coal blending are the same as those considered earlier, with the characteristics given in Table 3-1. The amount of each of the three types of coal that is needed for blending with current coal supplies is calculated for each level of allowable SO_2 emission.

As with burning of all low-sulfur coal, the burning of blended coals can cause problems with operation of the furnace or boiler. The potential problems are essentially the same as those just discussed, involving possible derating of the boiler and ESP. Again, the degree of degradation depends largely on specific characteristics of the boiler, the ESP, and the blended coals.

Estimates of capital and annual costs for use of blended coal are also based on the same considerations, related to equipment and labor required for modifications, utility usage, and the like. In addition, both capital and annual cost estimates include the costs of the coal blending facility and its operation and maintenance.

3.4 COAL WASHING

Although suppliers of coal are not specifically identified, the coal districts supplying many of the plants are known. Assumed coal washability data are derived from information published by the USBM on coals from producing districts in West Virginia, Ohio, Pennsylvania, Indiana, and Kentucky.

The average (mean) washability for all coals in each state is calculated at specific gravities of 1.3 and 1.6 (3/8" x 100 mesh) and these values applied as appropriate for each power station.

When part of a plant's current coal supply is low-sulfur coal, that part is excluded from the coal cleaning evaluation. It is included, however, in calculating SO_2 emissions from burning of raw and clean coals.

Size of the cleaning plant is based on a weight yield of 89 percent for cleaning at 1.6 specific gravity and 48 percent for cleaning at 1.3 (deep cleaning). The size is expressed as tons of raw coal cleaned per hour (TPH), based on 6000 hours of operation per year.

Cleaning plants of less than 50 TPH capacity are not considered. Coal cleaning is cost-advantageous only when large quantities of coal are to be cleaned. For some individual stacks, coal cleaning offers little or no benefit. Most of the coal cleaning costs are calculated by plant, and the following criteria determine calculations for individual stacks.

1. For a plant with more than three stacks, cost analysis for individual stacks is not feasible;

2. For a plant with three stacks or less, costs are calculated by stack unless an individual stack/boiler system requires a coal cleaning plant of less than 50 TPH capacity.

Capital costs are based on $20,000/TPH for 1.6 gravity cleaning and $25,000/TPH for deep cleaning. Although the deep-cleaning plant produces a middling fraction as well as a refuse fraction, for this study only a single product is considered.

Various operating costs used in the analysis are as follows:

- 30.00;ton of raw coal for raw material and utilities.
- $123.00/hour for labor, supervision, and associated overhead at plants under 500 TPH capacity.
- $143.00/hour for labor, supervision and associated overhead at plants over 500 TPH capacity.
- 24.65 percent of capital costs for maintenance and supplies.

Coal lost from the deep-cleaning plant is assumed to have a heating value of 10,000 Btu/lb, equivalent to $10/ton of coal lost ($0.50/MM Btu). Although over 90 percent of this coal is recoverable in a second stage of cleaning, no credit is taken since there is no guaranteed market for such a product.

The low-Btu coal lost from conventional cleaning at 1.6 gravity is assumed to contain 6000 Btu/lb, equivalent to $6.00/ton of coal lost ($0.50/MM Btu).

Capital cost for coal cleaning includes the parameters discussed earlier for the other control methods. The capacity penalty is based on the amounts of steam, water, and electricity required to maintain the coal-cleaning components. In all cases, the capacity penalty was less than 1 percent. The requirement for additional uncleaned coal is computed as follows:

$$\%\ \text{Coal}_{\substack{\text{additional}\\ \text{uncleaned}}} = \left[\frac{\text{Coal}_{\text{to be cleaned}} + \text{Coal}_{\text{uncleaned}} - \text{Coal}_{\text{current}}}{\text{Coal}_{\text{current}}}\right] \times 100$$

3.5 POWER PLANT PHASEOUT

Because of the age, use, or efficiency of certain power plants, it may be economically unreasonable to incorporate any of the forementioned methods of SO_2 reduction. These units may be candidates for shutdown if a suitable replacement facility is available. The following criteria are applied in determining phaseout potential:

- 5 years or less of remaining life, based on 40-year life of the unit.
- capacity factor below 30 percent due to age or inefficiency (malfunctions and turbine outage are not considered inefficient)

The units proposed for phaseout are identified in Section 4.0.

3.6 TALL STACKS

Ambient ground-level concentrations of SO_2 can be reduced by emitting flue gases through taller stacks. Although this technique for SO_2 reduction is not being considered at this time, a generic cost analysis for the tall-stack option is included at the request of EPA.

Figure 3-3 shows the capital costs of various stack heights as a function of stack diameter. Stack diameter values for specific plants are available from the Ohio Environmental Protection Agency in an Emissions Inventory

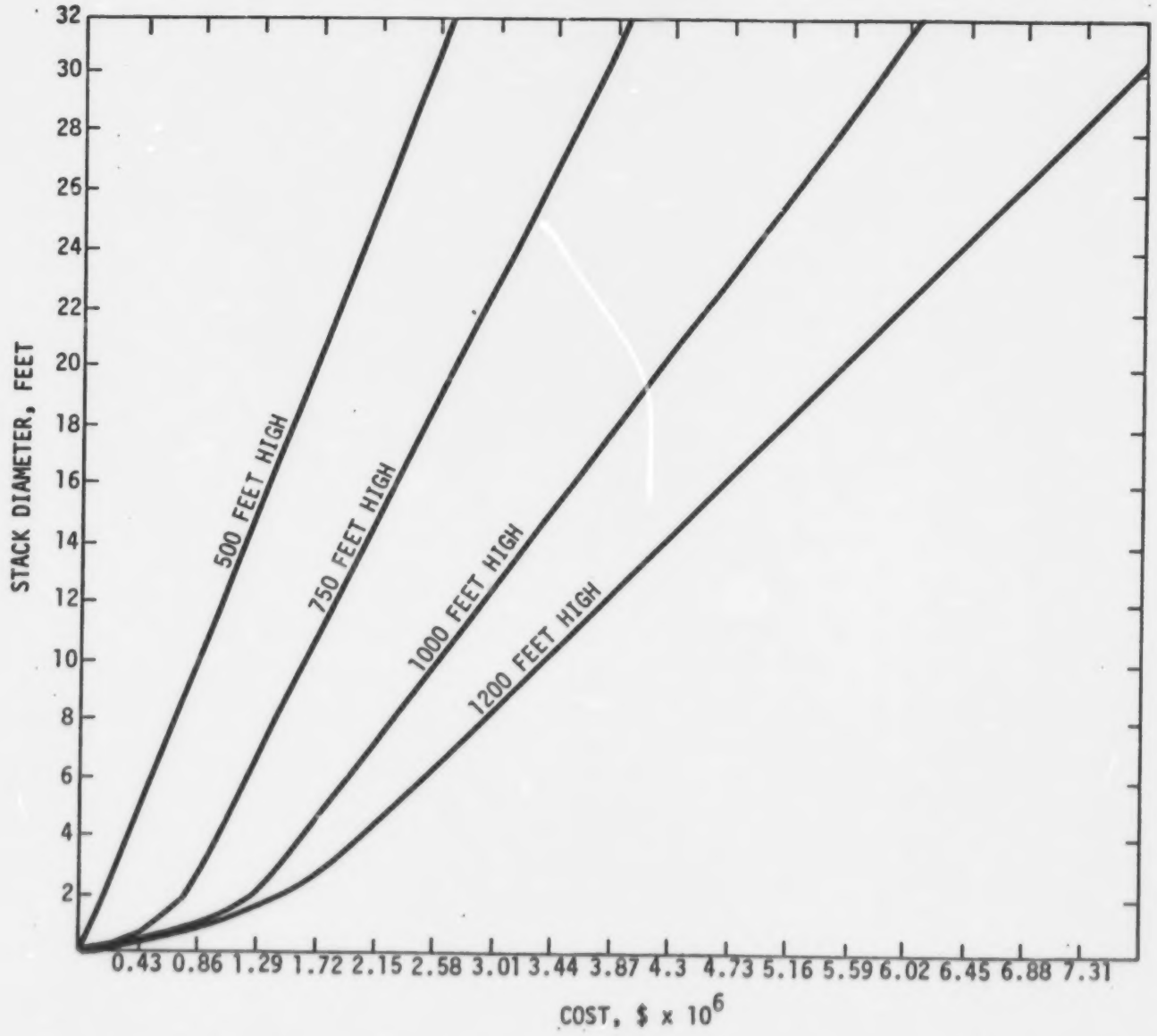

Figure 3-3. Costs for constructing exhaust stacks on utility boilers.

Confirmation Report dated October 26, 1975 or from forms completed by utilities for the Federal Power Commission. Use of tall stacks entails no annual costs.

3.7 COMPLIANCE SCHEDULES

3.7.1 Particulate Control Systems

A schedule for installation of an electrostatic precipitator on a medium-sized (150 MW) boiler/control system is presented below:

Milestone	Activity
(1)	Prepare preliminary control plan and compliance schedule for agency - 12 weeks
(2)	Receive agency approval - 4 weeks
(3)	Finalize plans and specifications - 6 weeks
(4)	Secure bids and evaluate same - 12 weeks
(5)	Award ESP contract - 4 weeks
(6)	Review and approve certified ESP drawings - 12 weeks (model test)
(6-7)	Fabricate, purchase, etc. ESP components by vendor - 56 weeks
(6-8)	Engineering and design-ducting and fans - 6 weeks
(8-9)	Procure and evaluate ducting and fans bids - 4 weeks
(9-10)	Award ducting and fans contract - 4 weeks
(10-11)	Fabricate and deliver ducting - 24 weeks
(10-12)	Fabricate and deliver fans - 28 weeks
(11-13)	Install ducting - 8 weeks
(11-14)	Install fans - 4 weeks

Milestone	Activity
(6-15)	Engineering and design layouts for construction work (foundations, site work, etc.) - 10 weeks
(15-16)	Prepare specs, drawings for bids, and evaluate bids - 4 weeks
(16-17)	Select contractor - 4 weeks
(17-18)	Prepare site, foundations, etc.; erection, testing, and shakedown - 84 weeks
(7-19)	Erect ESP, ducting, fans - 32 weeks
(19-20)	Breeching, etc. - 4 weeks
(20-21)	Test system components - 2 weeks
(21-22)	Shakedown to start-up - 8 weeks

Total 152 weeks

Engineering: plant and consultants 0-152nd (weeks 152)

ESP equipment: 38th - 106th (weeks 68)

Ducting: 60th - 92nd (weeks 32)

Fans: 58th - 90th (weeks 32)

Contractor for erection, etc., 68th - 152nd (weeks - 84)

Capital costs for the various components are as follows:

	Cost	Total weeks	Weeks covered
Engineering costs 6%	$ 1,107,000	152	0 to 152nd
Contingency 20%	4,962,000	94	58th to 152nd
Spares - 1% of equipment cost	71,000	8	140th to 148th
Shakedown - 5%	922,000	10	142nd to 152nd
Interest - 8% (on money spent	1,476,000	152	0 to 152nd
Contractor - 10%	1,845,000	88	64th to 152nd
Freight - 2.5% of equipment cost	177,000	46	60th to 106th

	Cost	Total weeks	Weeks covered
Taxes - 3% of equipment cost	213,000	68	38th to 106th
Offsites - 3%	553,000	88	64th to 152nd
ESP equipment costs - 90%	5,831,000	88	38th to 106th
ESP equipment costs - 10%	648,000	1	152nd
Ducting	552,000	32	60th to 92nd
Fans equipment cost - 90%	82,000	32	58th to 90th
Fans equipment cost - 10%	9,000	1	152nd
Erection, foundation, electrical, etc.	11,356,000	82	70th to 152nd

All costs except interest are on a straight-line basis for weekly expenditures over the period "weeks covered." Interest would be computed at 8 percent on an as-spent basis.

The first 5 and second 5 weeks of engineering are considered as one 5-week period. All costs are for 5 week intervals. Not until the 38th week are any costs other than those for engineering included (except for interest). As an illustration, expenses the 76th to 80th week would include the following: engineering; contingency; interest; contractor; freight; taxes; offsites; ESP equipment; fan and ducting; erection - plus those accumulated for the preceding 75 weeks.

Percentages versus weeks for the accumulative costs are as follows:

Accumulative weeks	Accumulative cost, %	Accumulative weeks	Accumulative cost, %
0	0	85	35.55
10	0.14	90	41.91
15	0.27	95	48.02
20	0.41	100	54.01
25	0.55	105	59.99
30	0.68	110	63.29
35	0.82	115	66.54
40	1.62	120	69.79
45	3.43	125	73.04
50	5.24	130	76.29
55	7.04	135	79.54
60	9.27	140	83.78
65	12.72	145	89.23
70	16.48	150	95.21
75	22.84	152	100.00
80	29.19		

3.7.2 Flue Gas Desulfurization

Critical path schedules for installation of limestone and Wellman-Lord FGD systems are based on three boiler sizes (140, 500, and 1300 MW) to allow comparison of timetables for small, medium, and large facilities. Figures 3-4, 3-5, and 3-6 illustrate schedules for the limestone system; Figures 3-7, 3-8, and 3-9 show schedules for the Wellman-Lord system.

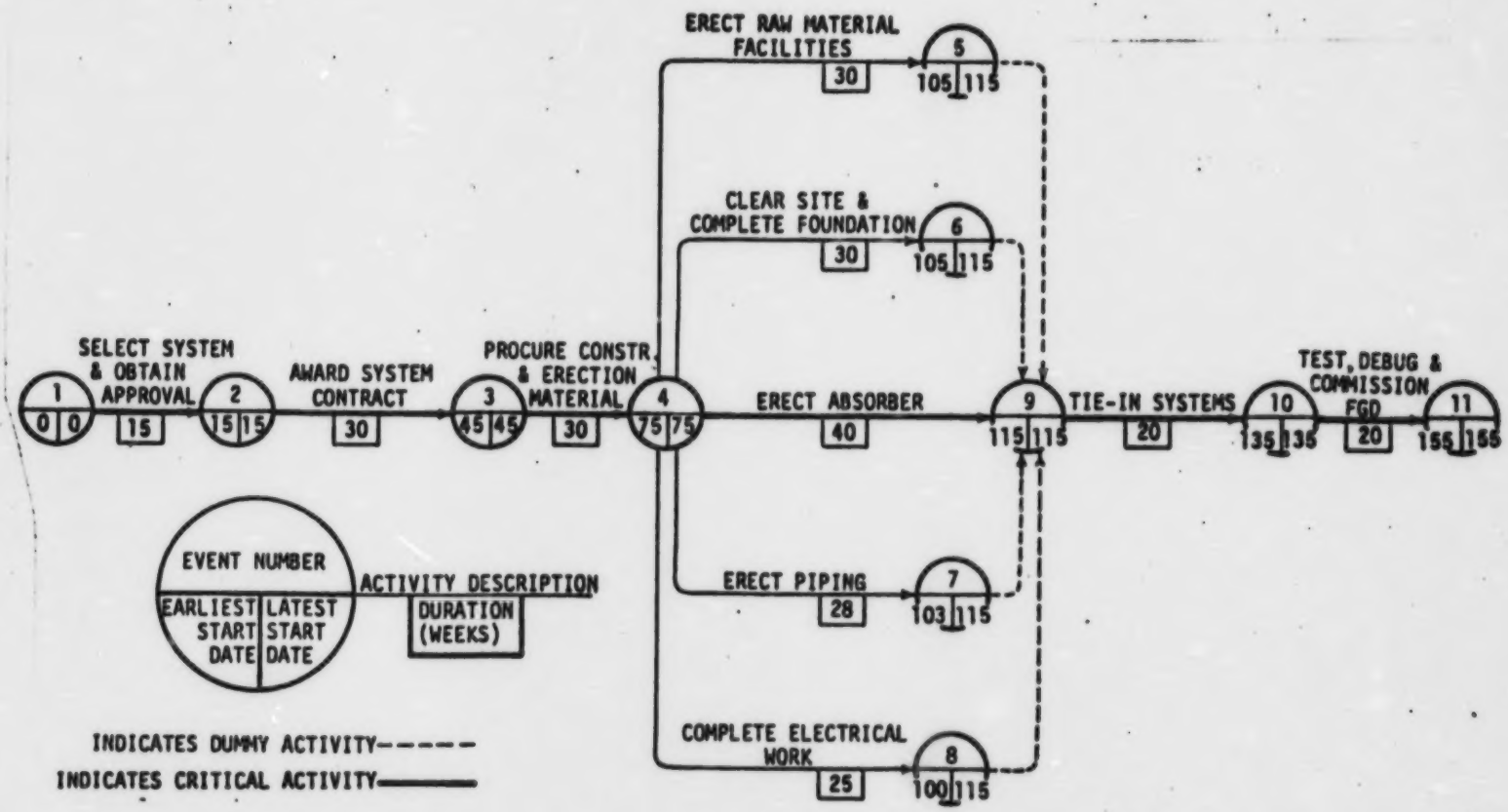

Figure 3-4. Critical path schedule for retrofitting FGD on 140 MW boiler (nonregenerable system).

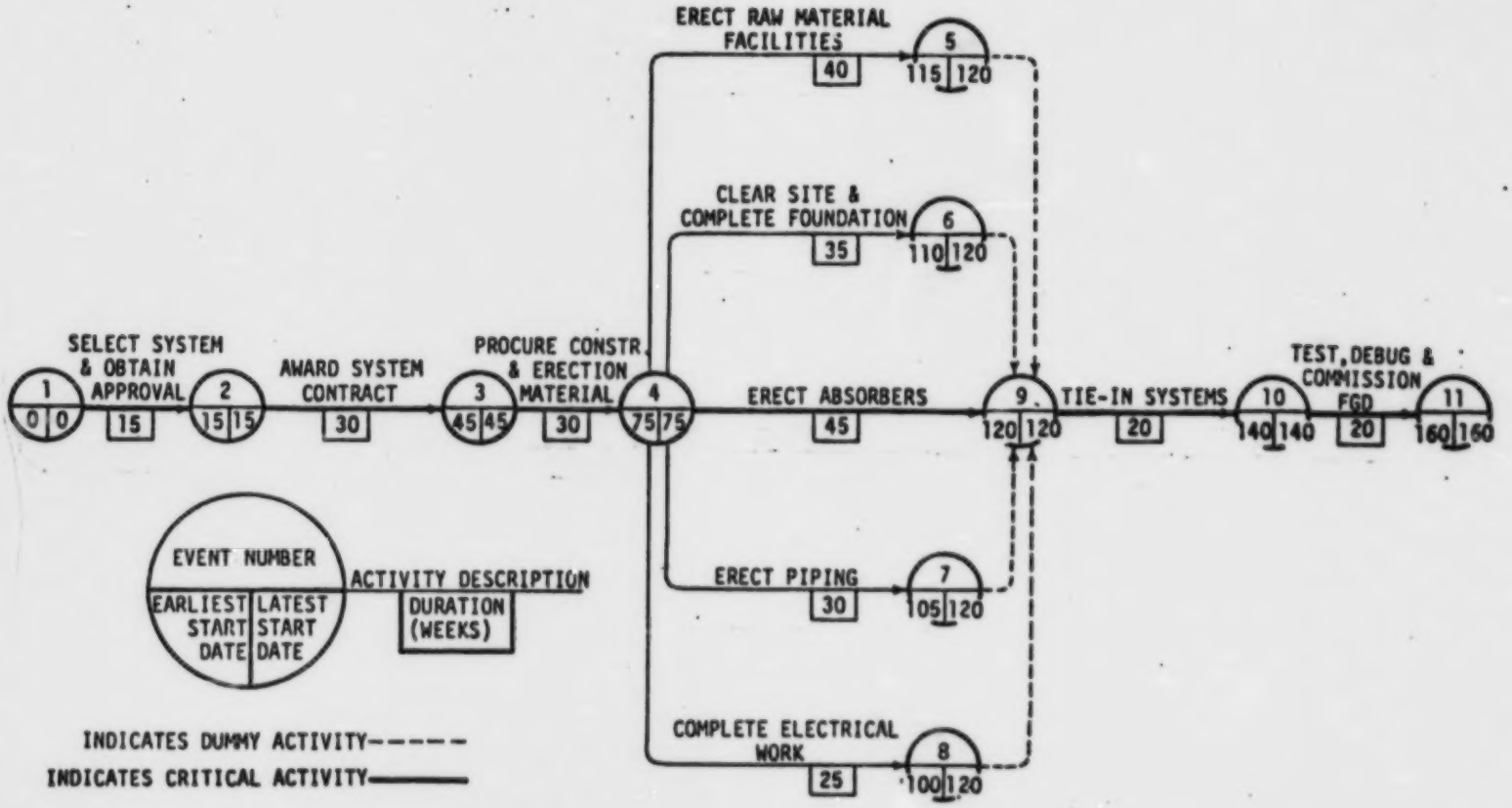

Figure 3-5. Critical path schedule for retrofitting FGD on 500 MW boiler (nonregenerable system).

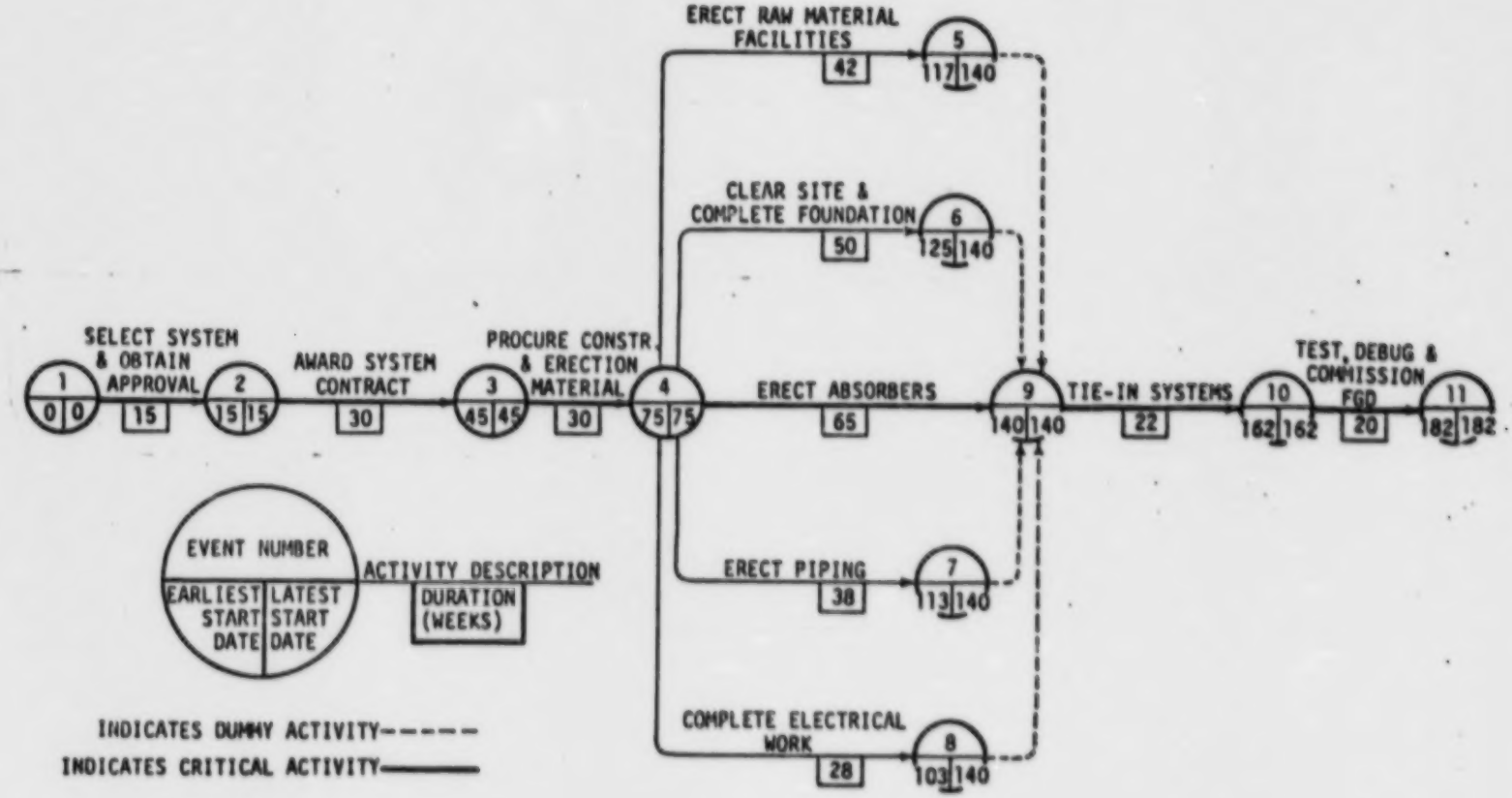

Figure 3-6. Critical path schedule for retrofitting FGD on 1300 MW boiler (nonregenerable system).

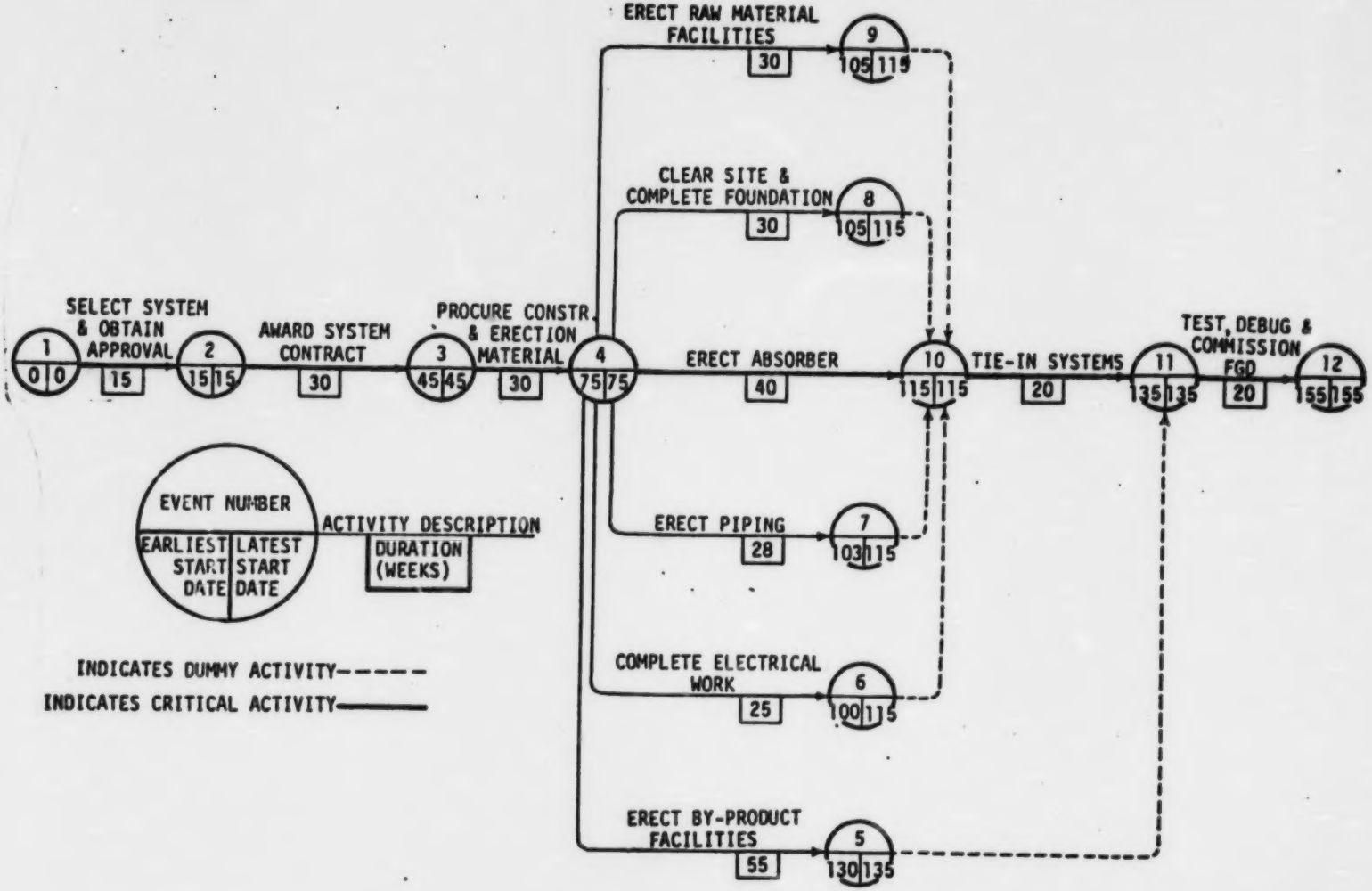

Figure 3-7. Critical path schedule for retrofitting FGD on 140 MW boiler (regenerable system).

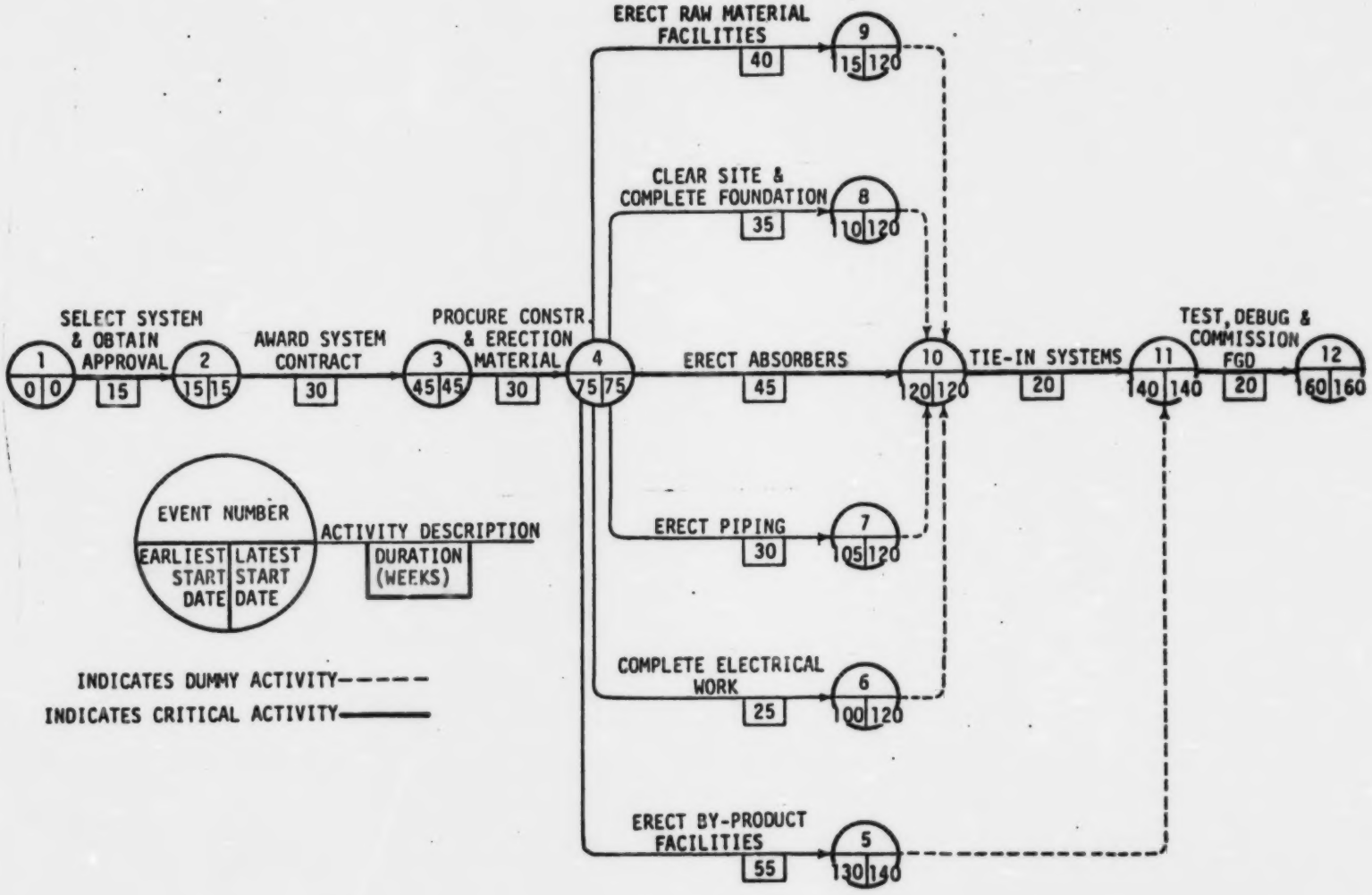

Figure 3-8. Critical path schedule for retrofitting FGD on 500 MW boiler (regenerable system).

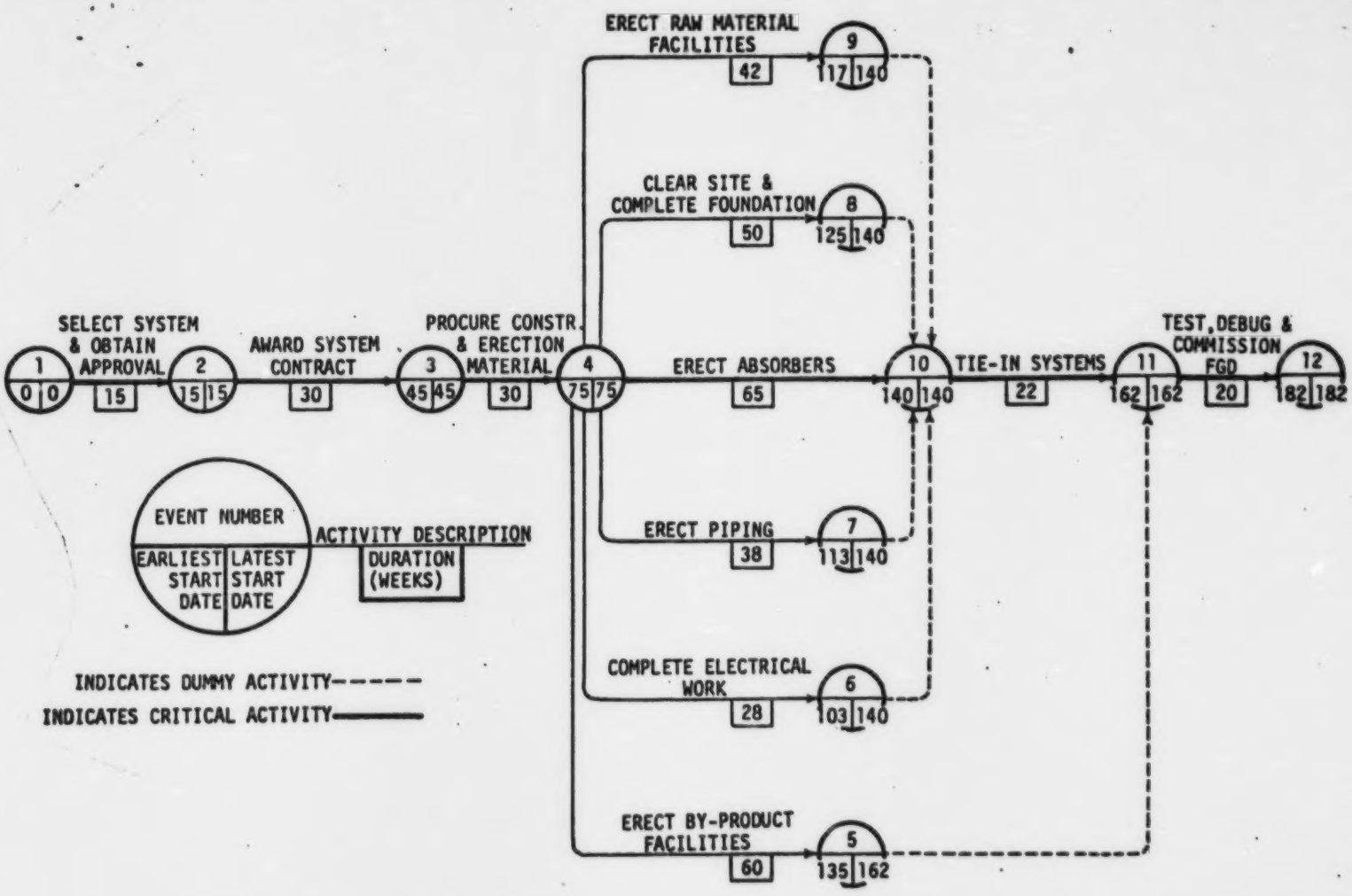

Figure 3-9. Critical path schedule for retrofitting FGD on 1300 MW boiler (regenerable system).

4.0 CAPITAL AND ANNUAL COSTS

Capital and operating costs for the several methods of SO_2 control are presented in Tables 4-1 and 4-2. Each table is arranged in the following manner:

Section 1.	SO_2 reduction levels
Section 2.	Flue gas desulfurization
Section 3.	Low-sulfur coal
Section 4.	Coal blending
Section 5.	Coal cleaning
Section 6.	Phaseout (listed under capital costs)

Costs of particulate controls to achieve compliance with Ohio particulate regulations are summarized in Table 4-3.

Plants are listed in the tables in alphabetical order. Boilers within each plant are grouped on a stack basis.

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
ACME 4	112.5	91		3.93	1.20	3.02	2.11	1.20
		92						
	71	13	4					
	71	14						
	71	15						
ACME 16	72	16	16	3.93	1.90	3.25	2.58	1.90
ACME PLANT	397.5							
ASHTABULA 5	46	8		4.63	1.20	3.49	2.34	1.20
	46	9	5					
	46	10						
	46	11						
ASHTABULA 4	256	18	4	4.63	1.20	3.49	2.34	1.20
ASHTABULA PLANT	440							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
AVON LAKE 5	86	9	5	4.92	1.80	3.88	2.84	1.80
AVON LAKE 6	86	10	6	4.92	1.80	3.88	2.84	1.80
AVON LAKE 7	233	11	7	4.92	1.30	3.71	2.51	1.30
AVON LAKE 8	680	12	8	4.92	1.20	3.68	2.44	1.20
AVON LAKE PLANT	1085							
BAYSHORE 1	140	1	1	3.18	1.50	2.62	2.06	1.50
BAYSHORE 2	140	2	2	3.18	1.50	2.62	2.06	1.50
BAYSHORE 3	140	3	3	3.18	1.50	2.62	2.06	1.50
BAYSHORE 4	218	4	4	3.18	1.30	2.55	1.93	1.30
BAYSHORE PLANT	638							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
BECKJORD 1	115	1	1	4.26	1.20	3.24	2.22	1.20
BECKJORD 2	113	2	2	4.26	1.20	3.24	2.22	1.20
BECKJORD 3	125	3	3	4.26	1.20	3.24	2.22	1.20
BECKJORD 4	163.2	4	4	4.26	1.20	3.24	2.22	1.20
BECKJORD 5	240	5	5	4.26	1.20	3.24	2.22	1.20
	434	6						
BECKJORD PLANT	1190.2							
BURGER 6	545	1	6	5.03	1.20	3.75	2.48	1.20
		2						
		3						
		4						
		5						
		6						
		7						
		8						
BURGER PLANT	545							

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
CARDINAL 1	5[illegible]	1	1	4.92	1.20	3.68	2.44	1.20
CARDINAL 2	590	2	2	4.92	1.20	3.68	2.44	1.20
CARDINAL PLANT	1180							
CLEVELAND MUN. 2	25	2	2	3.89	1.81	3.20	2.50	1.81
CLEVELAND MUN. 3	25	3	3	3.89	1.81	3.20	2.50	1.81
CLEVELAND MUN. 4	25	4	4	3.89	1.81	3.20	2.50	1.81
CLEVELAND MUN. 5	25	5	5	3.89	1.81	3.20	2.50	1.81
CLEVELAND MUN. 6	85	6	6	3.89	1.95	3.24	2.60	1.95
CLEVELAND PLANT	185							
CONESVILLE 1	125	1	1	7.70	4.40	6.60	5.50	4.40
	125	2						
CONESVILLE 2	125	3	2	7.70	4.40	6.60	5.50	4.40
CONESVILLE 3	787	4	3	7.70	4.40	6.60	5.50	4.40
CONESVILLE 4	411	5	4	9.00	4.40	7.34	5.67	4.00
CONESVILLE PLANT	1573							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
EAST LAKE 1	123	1	1	4.28	1.60	3.39	2.49	1.60
EAST LAKE 2	123	2	2	4.28	1.60	3.39	2.49	1.60
EAST LAKE 3	123	3	3	4.28	1.60	3.39	2.49	1.60
EAST LAKE 4	208	4	4	4.28	1.40	3.32	2.36	1.40
EAST LAKE 5	680	5	5	4.28	1.20	3.25	2.23	1.20
EAST LAKE PLANT	1257							
EDGEWATER 1	88	11	1	4.41	1.40	3.41	2.40	1.40
	88	12						
EDGEWATER 2	105	13	2	4.41	1.70	3.51	2.60	1.70
EDGEWATER PLANT	281							
GAVIN 1	1300	1	1	6.86	4.40	6.04	5.22	4.40
	1300	2						
GAVIN PLANT	2600							
GORGE 1	44	25	1	5.71	2.20	4.54	3.37	2.20
GORGE 2	44	26	2	5.71	2.20	4.54	3.37	2.20
GORGE PLANT	88							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
KYGER CREEK 1	217	1	1	6.45	4.40	5.77	5.08	4.40
	217	2						
KYGER CREEK 2	217	3	2	6.45	4.40	5.77	5.08	4.40
KYGER CREEK 3	217	4	3	6.45	4.40	5.77	5.08	4.40
	217	5						
KYGER CREEK PLANT	1085							
LAKESHORE 1	60	91	1	3.81	2.00	3.21	2.60	2.00
LAKESHORE 2	60	92	2	3.81	2.00	3.21	2.60	2.00
LAKESHORE 3	69	93	3	3.81	1.90	3.17	2.54	1.90
LAKESHORE 4	69	94	4	3.81	1.90	3.17	2.54	1.90
LAKESHORE 5	256	18	5	3.81	1.30	2.97	2.14	1.30
LAKESHORE PLANT	514							

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
MIAMI FORT 3	65	4-1	3	5.61	1.20	4.14	2.67	1.20
	65	4-2						
	100	5-1						
	100	5-2						
MIAMI FORT 4	168	6	4	5.61	1.20	4.14	2.67	1.20
MIAMI FORT 5	512	7	5	5.61	1.20	4.14	2.67	1.20
MIAMI FORT PLANT	1010							
MUSKINGUM RIVER 1A	213	1	1A	9.22	2.40	6.95	4.67	2.40
	213	2						
	225	3						
	225	4						
MUSKINGUM RIVER 2	590.8	5	2	9.22	2.40	6.95	4.67	2.40
MUSKINGUM RIV.PLT.	1466.8							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
NILES 1	125	1	1	5.29	1.60	4.06	2.83	1.60
NILES 2	125	2	2	5.29	1.60	4.06	2.83	1.60
NILES PLANT	250							
NORWALK 4	13	4	4	6.20	4.80	5.73	5.27	4.80
NORWALK 5	18.4	5	5	6.20	4.80	5.73	5.27	4.80
NORWALK PLANT	31.4							
ORRVILLE 1	16.5	9	1	7.69	2.80	6.06	4.43	2.80
	16.5	10						
	16.5	11						
ORRVILLE 2	22.0	12	2	7.69	2.80	6.06	4.43	2.80
	25.0	13						
ORRVILLE PLANT	96.5							

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
PAINESVILLE 1	4	1		4.48	1.60	3.52	2.56	1.60
	8	2						
	8	3	1					
	2.5	4						
		5						
PAINESVILLE PLANT	39.5							
PHILO 4	85	41						
		42	4	6.21	1.20	4.54	2.87	1.20
PHILO 5	85	51						
		52	5	6.21	1.20	4.54	2.87	1.20
PHILO 6	125	6	6	6.21	1.20	4.54	2.87	1.20
PHILO PLANT								

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
PICWAY 1	30	7	1	7.98	6.00	7.32	6.66	6.00
PICWAY 2	30	8	2	7.98	6.00	7.32	6.66	6.00
PICWAY 3	85	9	3	7.98	6.00	7.32	6.66	6.00
PICWAY PLANT	145							
PIQUA 1	33	1	1	4.33	2.80	3.82	3.31	2.80
	33	2						
PIQUA 2	33	3	2	4.33	2.80	3.82	3.31	2.80
PIQUA 3	33	4	3	4.33	2.80	3.82	3.31	2.80
PIQUA 4	33	5	4	4.33	2.80	3.82	3.31	2.80
PIQUA 5	20	6	5	4.33	2.80	3.82	3.31	2.80
PIQUA PLANT	185							

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
POSTON 1	40	1	1	4.93	3.20	4.35	3.78	3.20
	40	2						
POSTON 2	60	3	2	4.93	3.20	4.35	3.78	3.20
	60	4						
POSTON PLANT	200							
SAMMIS 1	185	1	1	4.33	1.20	3.29	2.24	1.20
	185	2						
SAMMIS 2	185	3	2	4.33	1.20	3.29	2.24	1.20
	185	4						
SAMMIS 3	318	5	3	4.33	1.20	3.29	2.24	1.20
	623	6						
SAMMIS 4	623	7	4	4.33	1.20	3.29	2.24	1.20
SAMMIS PLANT	2304							

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
STUART 1	152.55	1	1	3.31	2.00	2.87	2.44	2.00
STUART 2	152.55	2	2	3.31	2.00	2.87	2.44	2.00
STUART 3	152.55	3	3	3.31	2.00	2.87	2.44	2.00
STUART 4	152.55	4	4	3.31	2.00	2.87	2.44	2.00
STUART PLANT	610.2							
TAIT 3	147	4	3	1.75	1.60	--	--	1.60
TAIT 4	147.1	5	4	1.75	1.60	--	--	1.60
TAIT PLANT	294.1							
TIDD 1	55.5	11	1	5.51	0.80	3.94	2.37	0.80
TIDD 2	55.5	12	2	5.51	0.80	3.94	2.37	0.80
TIDD 3	111.1	21	3	5.51	0.80	3.94	2.37	0.80
TIDD PLANT	222.1							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu		
						Alternative 1	Alternative 2	Regulation
TORONTO 12	43.75	9	12	5.07	2.50	4.21	3.36	2.50
	66	10						
	66	11						
TORONTO PLANT	175.75							
WOODCOCK 1	5	1	1	1.79	1.60	--	--	1.60
	5	2						
	8	3						
WOODCOCK 2	11	4	2	1.79	1.60	--	--	1.60
	11	5						
WOODCOCK PLANT	40							

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu			Reason for not calculating cost alternatives
						Alternative 1	Alternative 2	Regulation	
ACME 2	30	9 10	2	1.80	1.6				Package units-firing oil
ACME 3	30	11 12	2	1.80	1.6				Package units-firing oil
ASHTABULA 1	200	1 2	1	1.30	1.2				In compliance-firing oil
		3 4	2						
ASHTABULA 2		5 6	3	1.30	1.2				In compliance-firing oil
AVON LAKE	190	1 2	1	1.50	1.4				In compliance-firing oil
AVON LAKE		3 4	2	1.50	1.4				In compliance-firing oil
AVON LAKE		5 6	3	1.50	1.4				In compliance-firing oil
AVON LAKE		7 8	4	1.50	1.4				In compliance-firing oil

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu			Reason for incomplete analysis
						Alternative 1	Alternative 2	Regulation	
HAMILTON MUNICIPAL	3	1							In compliance, firing 1.0% oil
	3	2							
	7.5	3							
	10	4							
	10	5							
	22	7							
	28	8							
HUTCHINGS 1	69	1	1	1.63	1.60	--	--	1.60	
	69	2							
HUTCHINGS 2	69	3	2	1.63	1.60	--	--	1.60	In compliance
	69	4							
HUTCHINGS 3	69	5	3	1.63	1.60	--	--	1.60	
	69	6							
HUTCHINGS PLANT	414								

Table 4.1; Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Size (MW)	Unit number	Stack number	Present SO_2 emissions lb/MM Btu	Proposed SO_2 regulation lb/MM Btu	Cost analysis values lb/MM Btu			Reason for incomplete analysis
						Alternative 1	Alternative 2	Regulation	
MAD RIVER 1	25	1	1	2.80	5.2				In compliance-firing o
MAD RIVER 2	25	2	2	2.80	5.2				In compliance-firing o
MAD RIVER 3	25	3	3	2.80	5.2				In compliance-firing o
	25	4							
MIAMI FORT 2	65	3-1	2	0.30	1.4				In compliance-firing o
	65	3-2							
NORWALK 1	13	1	1	0.30	4.8				In compliance-firing o
NORWALK 2	13	2	2	0.30	4.8				In compliance-firing o
	12	3							
TAIT 1	37.5	7-1	1	1.75	1.8				In compliance-firing 1.0% S coal
	37.5	7-2							
TAIT 2	37.5	8-1	2	1.75	1.8				In compliance-firing 1.0% S coal
	37.5	8-2							

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
ACME 4	7.09	0.32	11.05	0.59	15.07	0.86	7.51	0.41	13.49	0.81	20.20	1.22
ACME 16	4.06	0.57	5.19	0.85	6.20	1.13	2.919	0.53	4.52	0.97	6.03	1.4
ACME PLANT	8.74	0.32	13.69	0.59	19.25	0.86	9.76	0.42	17.19	0.83	25.29	1.23
ASHTABULA 5	10.82	1.18	19.35	2.29	27.57	3.36	12.63	1.5	25.02	3.0	36.4	4.48
ASHTABULA 4	7.68	0.40	11.78	0.74	15.60	1.07	8.14	0.549	14.5	1.09	21.6	1.62
ASHTABULA PLANT	15.56	0.68	27.79	1.35	39.59	1.98	19.77	0.93	38.22	1.89	56.49	2.80

Table 4-1: Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
AVON LAKE 5	4.90	0.19	6.67	0.30	8.37	0.42	4.32	0.217	7.14	0.415	9.85	0.603
AVON LAKE 6	4.66	0.19	6.62	0.30	8.30	0.42	4.27	0.217	7.07	0.415	9.75	0.603
AVON LAKE 7	7.30	0.42	11.06	0.76	14.63	1.10	7.67	0.57	13.59	1.13	20.33	1.67
AVON LAKE 8	14.14	0.34	24.92	0.65	36.09	0.96	17.89	0.51	35.51	1.03	51.69	1.53
AVON LAKE PLANT	23.43	0.25	40.89	0.49	58.54	0.73	31.45	0.39	59.80	0.79	87.43	1.18
BAYSHORE 1	4.83	0.35	6.51	0.61	8.11	0.83	3.86	0.40	6.28	0.74	8.59	1.09
BAYSHORE 2	4.90	0.38	6.62	0.61	8.25	0.83	3.87	0.40	6.30	0.74	8.62	1.09
BAYSHORE 3	4.95	0.38	6.69	0.61	8.32	0.83	3.86	0.40	6.28	0.74	8.60	1.09
BAYSHORE 4	6.20	0.33	8.96	0.58	11.46	0.82	5.48	0.40	9.35	0.77	13.01	1.13
BAYSHORE PLANT	13.32	0.26	20.67	0.50	27.60	0.74	14.90	0.37	25.51	0.73	35.69	1.07

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
PECKJORD 1	4.67	0.58	6.41	0.95	8.08	1.33	3.98	0.66	6.70	1.26	9.34	1.85
BECKJORD 2	4.78	0.60	6.60	0.99	8.35	1.39	4.11	0.69	6.94	1.32	9.70	1.93
BECKJORD 3	5.23	0.55	7.54	0.96	9.61	1.34	4.78	0.66	8.31	1.29	11.63	1.90
BECKJORD 4	5.71	0.47	8.37	0.82	10.79	1.16	5.38	0.58	9.45	1.14	13.30	1.67
BECKJORD 5	14.68	0.39	27.03	0.75	38.21	1.11	19.66	0.58	37.23	1.15	55.51	1.71
BECKJORD PLANT	24.65	0.38	44.69	0.75	63.16	1.12	34.47	0.58	64.18	1.16	94.21	1.73
BURGER 6	14.23	0.46	26.40	0.88	37.35	1.30	20.20	0.71	38.07	1.40	56.77	2.09
BURGER PLANT	14.23	0.46	26.40	0.88	37.36	1.30	20.20	0.71	38.07	1.40	56.77	2.09

Table 4-1: Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
CARDINAL 1	12.90	0.37	22.77	0.72	32.13	1.05	16.63	0.57	33.04	1.14	48.01	1.69
CARDINAL 2	13.02	0.37	22.94	0.72	32.34	1.05	16.75	0.57	33.21	1.14	48.22	1.69
CARDINAL PLANT	22.69	0.35	42.07	0.70	60.55	1.03	32.15	0.57	64.57	1.14	94.19	0.169
CLEVELAND 2	3.15	0.93	3.60	1.15	3.98	1.38	1.85	0.66	2.52	1.05	3.14	1.45
CLEVELAND 3	3.15	0.93	3.60	1.15	3.98	1.38	1.85	0.66	2.52	1.05	3.14	1.45
CLEVELAND 4	3.15	0.93	3.60	1.15	3.98	1.38	1.85	0.66	2.52	1.05	3.14	1.45
CLEVELAND 5	3.15	0.93	3.60	1.15	3.98	1.38	1.85	0.66	2.52	1.05	3.14	1.45
CLEVELAND 6	4.00	0.45	5.00	0.64	5.87	0.84	2.97	0.48	4.55	0.82	6.05	1.19
CLEVELAND PLANT	9.52	0.40	13.58	0.60	16.34	0.80	8.81	0.45	12.87	0.81	16.75	1.18
CONESVILLE 1	6.19	0.33	8.93	0.57	11.49	0.81	6.20	0.44	10.39	0.81	14.37	1.17
CONESVILLE 2	4.85	0.48	7.21	0.76	8.93	1.04	5.72	0.76	9.02	1.34	12.24	1.91
CONESVILLE 3	14.65	0.30	24.71	0.55	34.40	0.80	20.97	0.53	38.49	0.97	54.61	1.41
CONESVILLE 4	24.66*	0.75*	27.95*	1.17*	34.94*	1.48*	20.55*	0.63*	26.72*	1.01*	30.83*	1.51*
CONESVILLE PLANT	20.32	0.29	34.33	0.54	47.98	0.79	30.60	0.53	54.97	0.97	77.81	1.41

* Gross estimate of costs.

Table 4-1: Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
EAST LAKE 1	4.84	0.48	6.66	0.79	8.37	1.10	4.23	0.57	7.11	1.07	9.91	1.57
EAST LAKE 2	4.82	0.48	6.05	0.79	8.36	1.10	4.22	0.57	7.09	1.07	9.87	1.57
EAST LAKE 3	4.85	0.48	6.69	0.79	8.43	1.10	4.24	0.57	7.12	1.07	9.92	1.57
EAST LAKE 4	6.29	0.41	9.32	0.74	12.12	1.05	6.48	0.55	11.40	1.08	16.12	1.60
EAST LAKE 5	13.33	0.32	23.25	0.61	32.88	0.90	16.43	0.48	32.63	0.94	47.47	1.40
EAST LAKE PLANT	23.49	0.32	40.97	0.62	57.93	0.92	31.82	0.49	60.39	0.98	87.38	1.47
EDGEWATER 1	4.61	0.29	6.15	0.46	7.63	0.64	3.81	0.32	6.19	0.59	8.47	0.89
EDGEWATER 2	4.83	0.48	6.45	0.76	7.96	1.05	3.95	0.53	6.41	1.00	8.71	1.46
EDGEWATER PLANT	7.21	0.29	10.32	0.50	13.23	0.72	7.20	0.38	11.94	0.72	16.47	1.07
GAVIN 1	28.22	0.19	51.03	0.37	75.01	0.55	40.13	0.31	78.14	0.62	116.51	0.92
GAVIN PLANT	28.27	0.19	51.12	0.37	75.14	0.55	40.13	0.31	78.14	0.62	116.51	0.92
GORGE 1	4.00	0.90	5.06	1.32	6.00	1.73	3.15	0.91	4.89	1.64	6.50	2.36
GORGE 2	4.13	0.92	5.24	1.35	6.22	1.78	3.17	0.92	4.92	1.67	6.57	2.41
GORGE PLANT	5.88	0.67	7.97	1.11	9.85	1.55	5.65	0.83	9.00	1.58	12.13	2.31

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
KYGER CREEK 1	6.75	0.19	9.85	0.33	12.67	0.47	7.22	0.27	12.56	0.53	17.59	0.78
KYGER CREEK 2	5.03	0.23	6.76	0.38	8.34	0.51	4.42	0.29	7.24	0.54	9.91	0.79
KYGER CREEK 3	6.79	0.19	9.89	0.33	12.73	0.47	7.26	0.27	12.62	0.53	17.67	0.78
KYGER CREEK PLANT	12.92	0.16	20.24	0.20	27.03	0.44	16.89	0.26	29.73	0.52	41.95	0.77
LAKESHORE 1	3.21	0.55	3.87	0.76	4.46	0.97	1.86	0.40	2.89	0.74	3.84	1.08
LAKESHORE 2	3.21	0.55	3.87	0.76	4.47	0.97	1.86	0.40	2.90	0.74	3.86	1.08
LAKESHORE 3	3.56	0.54	4.51	0.79	5.35	1.04	2.23	0.45	3.62	0.85	4.93	1.24
LAKESHORE 4	3.57	0.54	4.52	0.79	5.37	1.04	2.23	0.45	3.64	0.85	4.95	1.24
LAKESHORE 5	6.29	0.35	9.66	0.63	12.85	0.90	5.74	0.41	10.73	0.83	16.29	1.35
LAKESHORE PLANT	11.04	0.28	17.21	0.54	22.99	0.79	11.88	0.37	21.21	0.77	30.90	1.15

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenera... wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
MIAMI FORT 3	7.20	0.31	10.85	0.55	14.47	0.80	8.17	0.43	14.42	0.85	21.61	1.26
MIAMI FORT 4	6.70	0.52	10.36	0.92	13.46	1.32	7.05	0.69	12.24	1.34	17.23	2.00
MIAMI FORT 5	12.80	0.35	22.65	0.69	32.00	1.00	16.53	0.55	33.01	1.11	47.91	1.66
MIAMI FORT PLANT	22.83	0.35	39.40	0.68	41.43	1.00	30.68	9.53	69.70	1.09	75.35	1.70
MUSKINGUM RIV. 1A	26.93	0.37	47.06	0.73	69.87	1.08	37.35	0.67	72.69	1.34	107.54	2.00
MUSKINGUM RIV. 2	14.41	0.39	25.04	0.75	35.39	1.10	21.18	0.72	41.78	1.42	60.96	2.14
MUSKINGUM RIV. PLT.	37.81	0.37	68.84	0.72	103.54	1.07	56.28	0.68	111.23	1.37	164.45	2.04

Table 4-1: Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
MILES 1	5.32	0.47	7.31	0.77	9.20	1.08	4.92	0.59	8.19	1.13	11.36	1.66
MILES 2	5.34	0.47	7.33	0.77	9.23	1.08	4.94	0.59	8.22	1.13	11.39	1.66
MILES PLANT	8.08	0.39	11.84	0.70	15.47	1.00	9.05	0.57	15.40	1.10	21.56	1.63
NORWALK 4	2.76	1.76	2.94	1.92	3.10	2.08	1.22	0.84	1.45	1.10	1.66	1.37
NORWALK 5	2.86	1.27	3.09	1.40	3.29	1.53	1.29	0.60	1.57	0.87	1.83	1.09
NORWALK PLANT	3.53	0.81	3.92	0.95	4.27	1.09	2.13	0.50	2.61	0.74	3.07	0.99
ORRVILLE 1	1.45*	1.01*	1.56*	1.38*	1.73*	1.71*	1.64*	1.00*	1.76*	1.35*	1.96*	1.63*
ORRVILLE 2	3.78*	0.92*	4.07*	1.29*	4.52*	1.53*	4.20*	0.90*	4.52*	1.28*	5.02*	1.48*
ORRVILLE PLANT	5.01*	0.94*	4.96*	1.33*	5.57*	1.59*	5.21*	0.93*	5.61*	1.31*	6.23*	1.52*

* Gross estimate of costs.

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
PAINESVILLE 1	3.76*	1.82*	4.18*	1.89*	4.40*	1.98*	4.17*	2.29*	4.64*	2.31*	4.88*	2.38*
PAINESVILLE PLANT	3.76*	1.82*	4.18*	1.89*	4.40*	1.98*	4.17*	2.29*	4.64*	2.31*	4.88*	2.38*
PHILO 4	4.37	0.54	4.69	0.84	6.92	1.15	4.15	0.68	6.72	1.27	9.17	1.86
PHILO 5	4.44	0.54	5.79	0.84	7.03	1.14	4.22	0.67	6.82	1.26	9.29	1.85
PHILO 6	5.21	0.46	7.16	0.76	9.01	1.06	4.39	0.51	7.21	0.99	9.95	1.44
PHILO PLANT	9.59	0.37	14.10	0.67	18.29	0.97	11.13	0.56	18.69	1.10	25.99	1.64

* Gross estimate of costs.

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
PICWAY 1	3.14	0.91	3.57	1.13	3.95	1.34	1.81	0.64	2.48	1.02	3.10	1.41
PICWAY 2	3.18	0.91	3.63	1.13	4.02	1.34	1.81	0.64	2.49	1.02	3.11	1.41
PICWAY 3	3.99	0.43	4.96	0.62	5.83	0.80	2.93	0.45	4.51	0.79	6.01	1.15
PICWAY PLANT	5.92	0.34	7.66	0.54	9.24	0.75	5.53	0.43	8.31	0.79	10.95	1.17
PIQUA 1	4.21	0.73	5.57	1.14	6.85	1.55	2.94	0.63	4.62	1.14	6.21	1.66
PIQUA 2	3.46	1.04	4.18	1.45	4.85	1.85	2.03	0.74	2.91	1.24	3.73	1.76
PIQUA 3	4.29	1.52	5.70	2.41	7.08	3.31	3.05	1.35	4.82	2.48	6.55	3.61
PIQUA 4	4.31	1.52	5.72	2.40	7.10	3.30	3.04	1.35	4.81	2.47	6.54	3.61
PIQUA 5	4.45	2.54	5.93	4.05	7.37	5.54	3.15	2.31	4.99	4.23	6.80	6.17
PIQUA PLANT	12.25	0.96	18.50	1.51	24.56	2.20	12.49	0.93	20.26	1.83	27.83	2.71

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
POSTON 1	3.86	0.50	4.84	0.73	5.76	0.97	2.81	0.48	4.36	0.88	5.85	1.27
POSTON 2	4.43	0.41	5.82	0.64	7.18	0.88	3.66	0.46	5.93	0.86	8.15	1.26
POSTON PLANT	5.92	0.34	8.17	0.58	10.34	0.82	5.81	0.44	9.48	0.76	13.08	1.12
SAMMIS 1	9.18	0.39	14.74	0.72	20.78	1.06	10.58	0.55	20.21	1.09	29.61	1.61
SAMMIS 2	9.26	0.39	14.85	0.72	20.90	1.06	10.60	0.55	20.24	1.09	29.65	1.61
SAMMIS 3	15.12	0.26	26.88	0.50	39.45	0.73	21.27	0.41	40.00	0.83	59.67	1.23
SAMMIS 4	14.79	0.37	26.47	0.72	39.13	1.06	19.40	0.55	36.36	1.09	54.45	1.63
SAMMIS PLANT	38.63	0.31	71.97	0.60	109.18	0.90	57.70	0.49	111.06	0.97	166.36	1.45

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
STUART 1	8.17	0.19	12.52	0.35	17.86	0.51	8.65	0.26	15.25	0.50	23.00	0.74
STUART 2	8.31	0.19	12.71	0.35	18.11	0.51	8.62	0.26	15.21	0.50	22.95	0.74
STUART 3	8.26	0.19	12.65	0.35	18.03	0.51	8.56	0.26	15.12	0.50	22.83	0.74
STUART 4	8.10	0.19	12.43	0.35	17.75	0.51	8.42	0.26	14.91	0.50	22.56	0.74
STUART PLANT	24.05	0.17	40.39	0.32	61.10	3.48	31.19	0.26	56.45	0.50	86.42	0.74
TAIT 3					3.88	0.27					2.51	0.22
TAIT 4					3.94	0.27					2.55	0.22
TAIT PLANT					5.62	0.20					4.60	0.20
TIDD 1	4.05	0.90	5.11	1.32	6.05	1.73	3.20	0.91	4.94	1.64	6.55	2.36
TIDD 2	4.05	0.90	5.11	1.32	6.05	1.73	3.20	0.91	4.94	1.64	6.55	2.36
TIDD 3	5.37	0.47	7.36	0.77	9.25	1.08	4.97	0.59	8.24	1.13	11.41	1.66
TIDD PLANT	9.43	0.69	13.19	1.05	17.08	1.41	9.10	0.75	15.40	1.39	22.06	2.01

Table 4-1; Section 2. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %	Alt. 1 cost, $ MM	Capacity penalty %	Alt. 2 cost, $ MM	Capacity penalty %	Regulation cost, $ MM	Capacity penalty %
TORONTO 12	6.06	0.45	8.81	0.77	11.40	1.11	6.19	0.59	10.64	1.12	14.98	1.68
TORONTO PLANT	6.06	0.45	8.81	0.77	11.40	1.11	6.19	0.59	10.64	1.12	14.98	1.68
WOODCOCK 1					2.97	1.46					1.54	0.839
WOODCOCK 2					3.09	1.24					1.61	0.743
WOODCOCK PLANT					3.99	0.81					2.72	

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
ACME 4	4.37	3.50	11.0	0.0	4.37	6.05	11.0	0.2	4.37	6.47	11.0	0.2
ACME 16	1.16	1.52	11.0	0.1	1.16	3.17	11.0	0.4	1.16	2.85	11.0	0.4
ACME PLANT	5.53	5.02	11.0	0.0	5.53	9.22	11.0	0.2	5.53	8.82	11.0	0.2
ASHTABULA 4	3.44	1.63	9.5	0.0	3.44	2.73	9.5	0.1	3.44	2.73	9.5	0.1
ASHTABULA 5	2.97	4.35	9.5	0.1	2.97	6.01	9.5	0.3	2.97	6.01	9.5	0.3
ASHTABULA PLANT	6.11	5.98	9.5	0.0	6.11	8.74	9.5	0.2	6.11	8.74	9.5	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western low Btu / Alternative 1 / Costs, $ MM		Alternative 1 / Derate, %		Alternative 2 / Costs, $ MM		Alternative 2 / Derate, %		Regulation / Costs, $ MM		Regulation / Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
AVON LAKE 5	1.39	1.09	9.5	0.0	1.39	1.58	9.5	0.1	1.39	2.23	9.5	0.2
AVON LAKE 6	1.39	1.09	9.5	0.0	1.39	1.58	9.5	0.1	1.39	2.23	9.5	0.2
AVON LAKE 7	3.76	1.49	9.5	0.0	3.76	2.93	9.5	0.1	3.76	2.99	9.5	0.1
AVON LAKE 8	7.31	4.70	9.5	0.0	7.31	14.09	9.5	0.2	7.31	14.81	9.5	0.2
AVON LAKE PLANT	13.85	8.28	9.5	0.0	13.85	20.18	9.5	0.2	13.85	22.86	9.5	0.2
BAYSHORE 1	2.26	1.36	9.5	0.0	2.26	2.50	9.5	0.1	2.26	2.65	9.5	0.1
BAYSHORE 2	2.26	1.36	9.5	0.0	2.25	2.50	9.5	0.1	2.26	2.65	9.5	0.1
BAYSHORE 3	2.26	1.60	9.5	0.0	2.26	2.50	9.5	0.1	2.26	2.65	9.5	0.1
BAYSHORE 4	2.26	4.28	9.5	0.2	3.51	4.42	9.5	0.2	3.51	4.60	9.5	0.2
BAYSHORE PLANT	10.29	8.60	9.5	0.1	10.29	11.92	9.5	0.1	10.29	12.10	9.5	0.1

Table 4.1: Section 1. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible] 1	1.89	1.92	9.5	0.1	1.89	3.58	9.5	0.4	1.85	3.58	9.5	0.4
[illegible] 2	1.82	1.25	9.5	0.1	1.82	3.86	9.5	0.4	1.82	3.86	9.5	0.4
[illegible] 3	2.02	2.07	9.5	0.1	2.02	4.42	9.5	0.4	2.02	4.42	9.5	0.4
[illegible] 4	2.63	1.37	9.5	0.0	2.63	2.40	9.5	0.1	2.63	2.40	9.5	0.1
[illegible] 5	7.24	7.81	9.5	0.1	7.24	18.68	9.5	0.4	7.24	18.68	9.5	0.4
[illegible] PLANT	15.56	14.92	9.5	0.1	15.56	32.94	9.5	0.4	15.56	32.94	9.5	0.4
[illegible] 6	5.86	5.84	9.5	0.1	5.86	18.63	9.5	0.5	5.86	19.14	9.5	0.5
[illegible] PLANT	5.86	5.84	9.5	0.1	5.86	18.63	9.5	0.5	5.86	19.14	9.5	0.5

Table 6.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MW		Derate, %		Costs, $ MW		Derate, %		Costs, $ MW		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible] 5	3.17	5.68	9.5	0.1	3.17	8.61	9.5	0.3	3.17	15.84	9.5	0.4
[illegible] 6	3.17	5.68	9.5	0.1	3.17	8.61	9.5	0.3	3.17	15.84	9.5	0.4
[illegible] PLANT	6.34	11.36	9.5	0.1	6.34	17.22	9.5	0.3	6.34	31.68	9.5	0.4
[illegible] NO. 2	0.48	0.49	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
[illegible] NO. 3	0.49	0.49	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
[illegible] NO. 4	0.49	0.49	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
[illegible] NO. 5	0.49	0.49	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
[illegible] NO. 6	1.16	0.49	11.0	0.1	1.16	1.75	11.0	0.4	1.16	2.85	11.0	0.4
[illegible] PLANT	3.09	1.52	11.0	0.0	3.08	5.17	11.0	0.2	3.08	5.17	11.0	0.2
[illegible] 1	4.03	0.90	11.0	0.0	4.03	2.06	11.0	0.0	4.03	2.10	11.0	0.0
[illegible] 2	2.02	0.19	11.0	0.0	2.02	0.062	11.0	0.1	2.02	1.17	11.0	0.0
[illegible] 3	8.06	6.76	11.0	0.1	8.46	7.37	11.0	0.0	8.46	8.29	11.0	0.1
[illegible] 4	5.05	1.09	11.0	0.0	5.05	1.18	11.0	0.0	5.05	1.34	11.0	0.0
[illegible] PLANT	20.36	9.12	11.0	0.1	20.36	11.24	11.0	0.0	20.36	12.90	11.0	0.1

Table 8.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible]	1.98	1.01	9.5	0.0	1.98	2.47	9.5	0.2	1.98	2.55	9.5	0.2
[illegible]	1.98	1.01	9.5	0.0	1.98	2.47	9.5	0.2	1.98	2.55	9.5	0.2
[illegible]	1.98	1.01	9.5	0.0	1.98	2.47	9.5	0.2	1.98	2.55	9.5	0.2
[illegible]	3.35	0.00	9.5	0.0	3.35	1.03	9.5	0.0	3.35	1.59	9.5	0.0
[illegible]	7.31	0.00	9.5	0.0	7.31	13.83	9.5	0.3	7.31	13.83	9.5	0.3
[illegible]	16.6	0.91	9.5	0.0	16.6	22.27	9.5	0.2	16.6	23.07	9.5	0.2
[illegible]	2.86	2.60	9.5	0.0	2.86	1.67	9.5	0.0	2.84	3.06	9.5	0.2
[illegible]	1.69	1.02	9.5	0.0	1.69	2.84	9.5	0.1	1.69	3.08	9.5	0.3
[illegible]	4.53	0.70	9.5	0.0	4.53	4.66	9.5	0.0	4.53	6.14	9.5	0.2
[illegible]	27.95	36.39	9.5	0.0	27.95	39.68	9.5	0.0	27.95	41.92	9.5	0.0
[illegible]	27.95	36.39	9.5	0.0	27.95	39.68	9.5	0.0	27.95	41.92	9.5	0.0
[illegible]	0.71	0.09	9.5	0.0	0.71	0.96	9.5	0.1	0.71	2.25	9.5	0.4
[illegible]	0.71	0.65	9.5	0.0	0.71	1.17	9.5	0.1	0.71	2.88	9.5	0.6
[illegible]	1.62	1.24	9.5	0.0	1.62	2.13	9.5	0.1	1.62	5.13	9.5	0.5

Table 6.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible]	5.83	1.09	11.0	0.0	5.83	1.18	11.0	0.0	5.83	1.34	11.0	0.0
[illegible]	3.50	1.68	11.0	0.0	3.50	2.18	11.0	0.0	3.50	3.68	11.0	0.1
[illegible]	5.83	4.37	11.0	0.0	5.83	2.92	11.0	0.0	5.83	3.68	11.0	0.1
RYGER CREEK PLANT	15.16	5.95	11.0	0.0	15.16	6.20	11.0	0.0	15.16	7.90	11.0	0.1
LAKESHORE 1	0.97	0.35	11.0	0.0	0.97	0.75	11.0	0.1	0.97	1.85	11.0	0.2
LAKESHORE 2	0.97	0.35	11.0	0.0	0.97	0.75	11.0	0.1	0.97	1.85	11.0	0.2
LAKESHORE 3	1.11	0.55	11.0	0.0	1.11	0.72	11.0	0.0	1.11	1.22	11.0	0.1
LAKESHORE 4	1.11	0.55	11.0	0.0	1.11	0.72	11.0	0.0	1.11	1.22	11.0	0.1
LAKESHORE 5	3.44	4.89	11.0	0.0	3.44	7.22	11.0	0.3	3.44	7.22	11.0	0.3
LAKESHORE PLANT	7.61	6.69	11.0	0.0	7.61	10.16	11.0	0.2	7.61	10.16	11.0	0.2

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Low sulfur coal / Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
MIAMI FORT 3	4.4	2.10	11.0	0.0	4.4	4.68	11.0	0.2	4.4	6.12	11.0	0.2
MIAMI FORT 4	3.71	1.94	11.0	0.0	2.71	3.33	11.0	0.2	2.71	5.47	11.0	0.4
MIAMI FORT 5	3.20	5.68	9.5	0.1	3.20	15.84	9.5	0.4	3.20	18.06	9.5	0.4
MIAMI FORT PLANT	10.35	9.72	10.1	0.1	10.35	23.85	10.1	0.3	10.35	29.65	10.1	0.4
MUSKINGUM RIVER 1A	9.42	9.84	9.5	0.0	9.42	12.62	9.5	0.1	9.42	24.70	9.5	0.3
MUSKINGUM RIVER 2	6.35	2.87	9.5	0.0	6.35	4.71	9.5	0.1	6.35	16.76	9.5	0.4
MUSKINGUM RIV. PLT.	15.77	12.79	9.5	0.0	15.77	17.33	9.5	0.1	15.77	41.46	9.5	0.3

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible] 1	2.02	1.06	9.5	0.0	2.02	2.58	9.5	0.1	2.02	2.83	9.5	0.2
[illegible] 2	2.02	1.06	9.5	0.0	2.02	2.58	9.5	0.1	2.02	2.83	9.5	0.2
[illegible] PLANT	4.04	3.12	9.5	0.0	4.04	5.16	9.5	0.1	4.04	5.66	9.5	0.2
[illegible] 4	0.21	0.31	11.0	0.0	0.21	0.31	11.0	0.0	0.21	0.33	11.0	0.1
[illegible] 5	0.30	0.29	11.0	0.0	0.30	0.34	11.0	0.0	0.30	0.38	11.0	0.1
[illegible] PLANT	0.51	0.60	11.0	0.0	0.51	0.65	11.0	0.0	0.51	0.71	11.0	0.1
[illegible] 1	0.40	0.32	11.0	0.0	0.40	0.33	11.0	0.0	0.40	0.38	11.0	0.0
[illegible] 2	0.62	0.48	11.0	0.0	0.62	0.91	11.0	0.0	0.62	1.73	11.0	0.2
[illegible] PLANT	1.02	0.80	11.0	0.0	1.02	1.34	11.0	0.0	1.02	2.11	11.0	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[redacted]	0.81	0.59	11.0	0.0	0.81	0.60	11.0	0.0	0.81	0.70	11.0	0.0
[redacted] PLANT	0.81	0.59	11.0	0.0	0.81	0.60	11.0	0.0	0.81	0.70	11.0	0.0
[redacted] 4	2.74	0.83	9.5	0.0	2.74	1.28	9.5	0.1	2.74	2.36	9.5	0.2
[redacted] 5	2.74	0.82	9.5	0.0	2.74	1.26	9.5	0.1	2.74	2.34	9.5	0.2
[redacted] 6	2.01	0.88	9.5	0.0	2.01	2.15	9.5	0.1	2.01	2.21	9.5	0.1
[redacted] PLANT	7.50	2.53	9.5	0.0	7.50	6.91	9.5	0.1	7.50	6.91	9.5	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
PICWAY 1	0.48	0.49	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
PICWAY 2	0.48	0.45	11.0	0.0	0.48	0.50	11.0	0.0	0.48	0.58	11.0	0.0
PICWAY 3	1.37	-	11.0	-	1.37	0.85	11.0	0.0	1.37	1.04	11.0	0.0
PICWAY PLANT	2.33	0.94	11.0	0.0	2.33	1.85	11.0	0.0	2.33	2.20	11.0	0.0
PIQUA 1	1.06	-	9.5	-	1.06	-	9.5	-	1.06	-	9.5	0.0
PIQUA 2	0.53	-	9.5	-	0.53	-	9.5	0.0	0.53	-	9.5	0.1
PIQUA 3	0.53	0.31	9.5	0.0	0.53	0.34	9.5	0.0	0.53	0.68	9.5	0.1
PIQUA 4	0.53	0.31	9.5	0.0	0.53	0.34	9.5	0.0	0.53	0.69	9.5	0.1
PIQUA 5	0.32	0.32	9.5	0.0	0.32	0.36	9.5	0.0	0.32	0.70	9.5	0.2
PIQUA PLANT	2.97	0.94	9.5	0.0	2.97	1.04	9.5	0.0	2.97	2.07	9.5	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible] 1	1.29	0.51	11.0	0.0	1.29	0.51	11.0	0.0	1.29	0.58	11.0	0.0
[illegible] 2	1.93	0.52	11.0	0.0	1.93	0.81	11.0	0.0	1.93	0.58	11.0	0.0
[illegible] PLANT	3.22	1.03	11.0	0.0	3.22	1.32	11.0	0.0	3.22	2.20	11.0	0.0
[illegible] 1	4.97	3.43	9.5	0.0	4.97	7.99	9.5	0.2	4.97	7.99	9.5	0.2
[illegible] 2	4.97	3.43	9.5	0.0	4.97	7.99	9.5	0.2	4.97	7.99	9.5	0.2
[illegible] 3	10.12	5.41	9.5	0.0	10.12	13.53	9.5	0.2	10.12	13.53	9.5	0.2
[illegible] 4	6.7	6.29	9.5	0.0	6.7	12.14	9.5	0.3	6.7	12.14	9.5	0.3
[illegible] PLANT	26.76	16.56	9.5	0.0	26.76	41.65	9.5	0.2	26.76	41.65	9.5	0.2

Table 6.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
STUART 1	6.56	1.06	9.5	0.0	6.56	1.36	9.5	0.0	6.56	3.16	9.5	0.1
STUART 2	6.56	1.06	9.5	0.0	6.56	1.36	9.5	0.0	6.56	3.16	9.5	0.1
STUART 3	6.56	1.06	9.5	0.0	6.56	1.36	9.5	0.0	6.56	3.16	9.5	0.1
STUART 4	6.56	1.06	9.5	0.0	6.56	1.36	9.5	0.0	6.56	3.16	9.5	0.1
STUART PLANT	26.24	4.24	9.5	0.0	26.24	5.40	9.5	0.0	26.24	12.64	9.5	0.1
ZIMMER 3	2.37	-	11.0	-	2.37	-	11.0	-	2.37	-	11.0	-
ZIMMER 4	2.37	-	11.0	-	2.37	-	11.0	-	2.37	-	11.0	-
ZIMMER PLANT	4.74	-	11.0	-	4.74	-	11.0	-	2.37	-	11.0	-
KYGER 3	0.71	0.89	9.5	0.0	0.71	0.96	9.5	0.1	N/A[a]	N/A[a]	N/A[a]	N/A[a]
KYGER 4	0.71	0.89	9.5	0.0	0.71	0.96	9.5	0.1	N/A[a]	N/A[a]	N/A[a]	N/A[a]
KYGER 5	2.02	0.89	9.5	0.0	2.02	2.15	9.5	0.1	N/A[a]	N/A[a]	N/A[a]	N/A[a]
KYGER PLANT	3.44	0.89	9.5	0.0	3.44	4.07	9.5	0.1	N/A[a]	N/A[a]	N/A[a]	N/A[a]

[a] Western low BTU coal will not meet 0.86 # regulation.

Table 6.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal: Western low Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
[illegible]	2.83	2.58	9.5	0.1	2.83	2.63	9.5	0.1	2.83	5.47	9.5	0.3
TORONTO PLANT	2.83	2.58	9.5	0.1	2.83	2.63	9.5	0.1	2.83	5.47	9.5	0.3
WOODCOCK 1	0.29	0.00	9.5	0.0	0.29	0.00	9.5	0.0	0.29	5.27	9.5	0.1
WOODCOCK 2	0.35	0.00	9.5	0.0	0.35	0.00	9.5	0.0	0.35	6.60	9.5	0.1
WOODCOCK PLANT	0.64	0.00	9.5	0.0	0.64	0.00	9.5	0.0	0.64	11.87	9.5	0.1

Table 4 1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
ACME 4	0.00	0.00	1.0	0.0	0.00	3.34	1.0	0.0	0.00	5.97	1.0	0.2
ACME 16	0.00	0.86	1.0	0.0	0.00	0.89	1.0	0.0	0.00	1.91	1.0	0.2
ACME PLANT	0.00	0.86	1.0	0.0	0.00	4.23	1.0	0.0	0.00	7.88	1.0	0.2
ASHTABULA 5	0.00	3.23	0.0	0.0	0.00	4.24	0.0	0.1	0.00	6.01	0.0	0.3
ASHTABULA 4	0.00	1.22	0.0	0.0	0.00	1.63	0.0	0.0	0.00	2.73	0.0	0.1
ASHTABULA PLANT	0.00	4.45	0.0	0.0	0.00	5.87	0.0	0.0	0.00	8.74	0.0	0.2

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
AVON LAKE 5	0.00	0.75	0.00	0.0	0.00	1.09	0.00	0.0	0.00	1.70	0.00	0.1
AVON LAKE 6	0.00	0.75	0.00	0.0	0.00	1.09	0.00	0.0	0.00	1.70	0.00	0.1
AVON LAKE 7	0.00	1.38	0.00	0.0	0.00	2.95	0.00	0.0	0.00	2.99	0.00	0.1
AVON LAKE 8	0.00	4.23	0.00	0.0	0.00	4.40	0.00	0.0	0.00	4.51	0.00	0.0
AVON LAKE PLANT	0.00	7.11	0.00	0.0	0.00	9.53	0.00	0.0	0.00	10.90	0100	0.1
BAYSHORE 1	0.00	0.00	0.00	0.0	0.00	1.08	0.00	0.0	0.00	2.50	0.00	0.1
BAYSHORE 2	0.00	0.00	0.00	0.0	0.00	1.08	0.00	0.0	0.00	2.50	0.00	0.1
BAYSHORE 3	0.00	0.00	0.00	0.0	0.00	1.14	0.00	0.0	0.00	2.49	0.00	0.1
BAYSHORE 4	0.00	0.00	0.00	0.0	0.00	1.87	0.00	0.0	0.00	4.41	0.00	0.2
BAYSHORE PLANT	0.00	0.00	0.00	0.0	0.00	5.17	0.00	0.0	0.00	11.90	0.00	0.1

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Low sulfur coal / Western high Btu / Alternative 1 Costs, $ MM: Boiler modification	Alternative 1 Costs, $ MM: ESP upgrade	Alternative 1 Derate, %: Boiler	Alternative 1 Derate, %: ESP	Alternative 2 Costs, $ MM: Boiler modification	Alternative 2 Costs, $ MM: ESP upgrade	Alternative 2 Derate, %: Boiler	Alternative 2 Derate, %: ESP	Regulation Costs, $ MM: Boiler modification	Regulation Costs, $ MM: ESP upgrade	Regulation Derate, %: Boiler	Regulation Derate, %: ESP
BECKJORD 1	0.00	0.95	0.0	0.0	0.00	2.01	0.0	0.1	0.00	3.58	0.0	0.4
BECKJORD 2	0.00	0.71	0.0	0.0	0.00	1.02	0.0	0.0	0.00	3.86	0.0	0.4
BECKJORD 3	0.00	0.86	0.0	0.0	0.00	1.19	0.0	0.0	0.00	4.42	0.0	0.4
BECKJORD 4	0.00	1.00	0.0	0.0	0.00	1.42	0.0	0.0	0.00	2.40	0.0	0.1
BECKJORD 5	0.00	4.89	0.0	0.0	0.00	6.31	0.0	0.1	0.00	18.68	0.0	0.4
BECKJORD PLANT	0.00	8.41	0.0	0.0	0.00	12.45	0.0	0.1	0.00	32.94	0.0	0.4
BURGER 6	0.00	5.36	0.0	0.0	0.00	5.84	0.0	0.1	0.00	19.15	0.0	0.5
BURGER PLANT	0.00	5.36	0.0	0.0	0.00	5.84	0.0	0.1	0.00	19.15	0.0	0.5

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
CARDINAL 1	0.00	4.27	0.00	0.0	0.00	5.68	0.0	0.1	0.00	15.84	0.0	0.4
CARDINAL 2	0.00	4.27	0.00	0.0	0.00	5.68	0.0	0.1	0.00	15.84	0.0	0.4
CARDINAL PLANT	0.00	8.54	0.00	0.0	0.00	11.36	0.0	0.1	0.00	31.68	0.0	0.4
CLEVELAND MUN. 2	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0
CLEVELAND MUN. 3	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0
CLEVELAND MUN. 4	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0
CLEVELAND MUN. 5	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0
CLEVELAND MUN. 6	0.00	0.89	1.0	0.0	0.00	0.89	1.0	1.0	0.00	2.72	1.0	0.02
CLEVELAND PLANT	0.00	0.89	1.0	0.0	0.00	0.89	1.0	0.0	0.00	2.72	1.0	0.01
CONESVILLE 1	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	1.14	1.0	0.00
CONESVILLE 2	0.00	0.00	1.0	0.0	0.00	0.53	1.0	0.0	0.00	0.56	1.0	0.00
CONESVILLE 3	0.00	0.00	1.0	0.0	0.00	0.00	1.0	0.0	0.00	0.56	1.0	0.00
CONESVILLE 4	0.00	0.00	1.0	0.0	0.00	0.97	0.0	0.0	0.00	1.12	1.0	0.00
CONESVILLE PLANT	0.00	0.00	1.0	0.0	0.00	1.50	1.0	0.0	0.00	9.51	1.0	0.00

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
EAST LAKE 1	0.00	0.58	0.00	0.0	0.00	1.25	0.00	0.0	0.00	2.55	0.0	0.2
EAST LAKE 2	0.00	0.90	0.00	0.0	0.00	1.47	0.00	0.0	0.00	2.88	0.0	0.2
EAST LAKE 3	0.00	0.58	0.00	0.0	0.00	1.25	0.00	0.0	0.00	2.55	0.0	0.2
EAST LAKE 4	0.00	0.58	0.00	0.0	0.00	0.67	0.00	0.0	0.00	1.33	0.0	0.0
EAST LAKE 5	0.00	4.65	0.00	0.0	0.00	7.40	0.00	0.0	0.00	13.86	0.0	0.3
EAST LAKE PLANT	0.00	6.79	0.00	0.0	0.00	12.40	0.00	0.0	0.00	20.87	0.0	0.2
EDGEWATER 1	0.00	0.65	0.00	0.0	0.00	0.71	0.00	0.0	0.00	3.06	0.0	0.2
EDGEWATER 2	0.00	0.75	0.00	0.0	0.00	1.01	0.00	0.0	0.00	1.28	0.0	0.0
EDGEWATER PLANT	0.00	1.40	0.00	0.0	0.00	1.72	0.00	0.0	0.00	4.34	0.0	0.1
GAVIN 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	34.85	0.0	0.0
GAVIN PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	34.85	0.0	0.0
GORGE 1	0.00	0.47	0.00	0.0	0.00	0.87	0.00	0.1	0.00	0.92	0.0	0.1
GORGE 2	0.00	0.42	0.00	0.0	0.00	0.92	0.00	0.1	0.00	0.94	0.0	0.1
GORGE PLANT	0.00	0.89	0.00	0.0	0.00	1.79	0.00	0.1	0.00	1.86	0.0	0.1

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
KYGER CREEK 1	0.0	0.0	1.0	0.0	0.00	0.97	1.0	0.0	0.00	1.12	1.0	0.0
KYGER CREEK 2	0.0	0.0	1.0	0.0	0.00	1.12	1.0	0.0	0.00	1.79	1.0	0.0
KYGER CREEK 3	0.0	0.0	1.0	0.0	0.00	2.00	1.0	0.0	0.00	3.42	1.0	0.0
KYGER CREEK PLANT	0.0	0.0	1.0	0.0	0.00	4.09	1.0	0.0	0.00	6.33	1.0	0.0
LAKESHORE 1	0.0	0.24	1.0	0.0	0.00	0.24	1.0	0.0	0.00	0.42	1.0	0.0
LAKESHORE 2	0.0	0.24	1.0	0.0	0.00	0.24	1.0	0.0	0.00	0.42	1.0	0.0
LAKESHORE 3	0.0	0.27	1.0	0.0	0.00	0.29	1.0	0.0	0.00	0.54	1.0	0.0
LAKESHORE 4	0.0	0.27	1.0	0.0	0.00	0.29	1.0	0.0	0.00	0.50	1.0	0.0
LAKESHORE 5	0.0	0.99	1.0	0.0	0.00	1.44	1.0	0.0	0.00	7.24	1.0	0.4
LAKESHORE PLANT	0.0	2.01	1.0	0.0	0.00	2.56	1.0	0.0	0.00	9.12	1.0	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
MIAMI FORT 3	0.00	1.09	1.0	0.0	0.00	2.10	1.0	0.0	0.00	5.24	1.0	0.3
MIAMI FORT 4	0.00	1.00	1.0	0.0	0.00	1.94	1.0	0.0	0.00	5.09	1.0	0.2
MIAMI FORT 5	0.00	4.27	1.0	0.0	0.00	5.68	1.0	0.0	0.00	15.84	1.0	0.3
MIAMI FORT PLANT	0.00	6.36	1.0	0.0	0.00	9.72	1.0	0.0	0.00	26.17	1.0	0.2
MUSKINGUM PLANT 1A	0.00	0.00	0.0	0.0	0.00	12.45	0.0	0.1	0.00	9.77	0.0	0.0
MUSKINGUM RIVER 2	0.00	0.00	0.00	0.0	0.00	4.18	0.0	0.1	0.00	2.82	0.0	0.0
MUSKINGUM RIV. PLT	0.00	0.00	0.00	0.0	0.00	16.63	0.0	0.1	0.00	12.59	0.0	0.0

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
NILES 1	0.00	0.69	0.0	0.0	0.00	1.06	0.0	0.0	0.00	2.76	0.0	0.2
NILES 2	0.00	0.69	0.0	0.0	0.00	1.06	0.0	0.0	0.00	2.76	0.0	0.2
NILES PLANT	0.00	1.38	0.0	0.0	0.00	2.12	0.0	0.0	0.00	5.52	0.0	0.2
NORWALK 4	0.00	0.24	1.0	0.0	0.00	0.25	1.0	0.0	0.00	0.25	1.0	0.0
NORWALK 5	0.00	0.00	1.0	0.0	0.00	0.24	1.0	0.0	0.00	0 25	1.0	0.0
NORWALK PLANT	0.00	0.24	1.0	0.0	0.00	0.49	1.0	0.0	0.00	0.50	1.0	0.0
ORRVILLE 1	0.00	2.05	1.0	0.2	0.00	2.05	1.0	0.2	0.00	2.05	1.0	0.2
ORRVILLE 2	0.00	3.59	1.0	0.2	0.00	3.59	1.0	0.2	0.00	3.59	1.0	0.2
ORRVILLE PLANT	0.00	5.64	1.0	0.2	0.00	5.64	1.0	0.2	0.00	5.64	1.0	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
PAINESVILLE 1	0.00	4.31	1.0	0.2	0.00	4.31	1.0	0.2	0.00	4.31	1.0	0.2
PAINESVILLE PLANT	0.00	4.31	1.0	0.2	0.00	4.31	1.0	0.2	0.00	4.31	1.0	0.2
PHILO 4	0.00	3.62	0.0	0.0	0.00	0.83	0.0	0.0	0.00	2.36	0.0	0.1
PHILO 5	0.00	3.62	0.0	0.0	0.00	0.83	0.0	0.0	0.00	2.36	0.0	0.1
PHILO 6	0.00	0.53	0.0	0.0	0.00	0.88	0.0	0.0	0.00	2.21	0.0	0.2
PHILO PLANT	0.00	7.77	0.0	0.0	0.00	2.54	0.0	0.0	0.00	10.12	0.0	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
PICWAY 1	0.0	0.0	1.0	0.0	0.00	0.0	1.0	0.0	0.00	0.00	1.00	0.0
PICWAY 2	0.0	0.0	1.0	0.0	0.00	0.0	1.0	0.0	0.00	0.00	1.00	0.0
PICWAY 3	0.0	0.0	1.0	0.0	0.00	0.0	1.0	0.0	0.00	0.00	1.00	0.0
PICWAY PLANT	0.0	0.0	1.0	0.0	0.00	0.0	1.0	0.0	0.00	0.00	1.00	0.0
PIQUA 1	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0
PIQUA 2	0.0	0.0	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.0
PIQUA 3	0.0	0.24	0.0	0.0	0.00	0.3	0.0	0.0	0.00	0.47	0.00	0.0
PIQUA 4	0.0	0.24	0.0	0.0	0.00	0.3	0.0	0.0	0.00	0.43	0.00	0.0
PIQUA 5	0.0	0.24	0.0	0.0	0.00	0.3	0.0	0.0	0.00	0.31	0.00	0.0
PIQUA PLANT	0.0	0.72	0.0	0.0	0.00	0.9	0.0	0.0	0.00	1.21	0.00	0.0

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
POSTON 1	0.00	2.35	1.0	0.0	0.00	0.38	1.0	0.0	0.00	0.89	1.0	0.0
POSTON 2	0.00	0.0	1.0	0.0	0.00	0.54	1.0	0.0	0.00	1.06	1.0	0.0
POSTON PLANT	0.00	0.4	1.0	0.0	0.00	0.92	1.0	0.0	0.00	1.95	1.0	0.0
SAMMIS 1	0.00	3.14	0.0	0.0	0.00	3.30	0.0	0.0	0.00	7.99	0.0	0.2
SAMMIS 2	0.00	3.14	0.0	0.0	0.00	3.30	0.0	0.0	0.00	7.99	0.0	0.2
SAMMIS 3	0.00	5.40	0.0	0.0	0.00	5.57	0.0	0.0	0.00	13.53	0.00	0.2
SAMMIS 4	0.00	3.97	0.0	0.0	0.00	4.16	0.0	0.0	0.00	12.14	0.0	0.3
SAMMIS PLANT	0.00	15.65	0.0	0.0	0.00	16.33	0.0	0.0	0.00	41.65	0.0	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
STUART 1	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.74	0.0	0.0
STUART 2	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.74	0.0	0.0
STUART 3	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.74	0.0	0.0
STUART 4	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.74	0.0	0.0
STUART PLANT	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	2.96	0.0	0.0
TAIT 3	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0
TAIT 4	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0
TAIT PLANT	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.0	0.0
TIDD 1	0.00											
TIDD 2	0.00											
TIDD 3	0.00											
TIDD PLANT	0.00											

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Western high Btu											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
TORONTO 12	0.0	1.47	0.0	010	0.00	2.27	0.0	0.0	0.0	2.46	0.0	0.1
TORONTO PLANT	0.0	1.47	0.0	0.0	0.00	2.27	0.0	0.0	0.0	2.46	0.0	0.1
WOODCOCK 1	0.0	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.48	0.0	0.1
WOODCOCK 2	0.0	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.55	0.0	0.1
WOODCOCK PLANT	0.0	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	1.03	0.0	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
ACME 4	0.00	0.00	0.00	0.0	0.00	3.19	0.00	0.0	0.00	5.97	0.00	0.2
ACME 16	0.00	0.89	0.00	0.0	0.00	0.89	0.00	0.0	0.00	2.72	0.00	0.2
ACME PLANT	0.00	0.89	0.00	0.0	0.00	4.08	0.00	0.0	0.00	8.09	0.00	0.2
ASHTABULA 5	0.00	2.96	0.00	0.0	0.00	4.24	0.00	0.1	0.00	6.01	0.00	0.3
ASHTABULA 4	0.00	1.11	0.00	0.0	0.00	1.63	0.00	0.0	0.00	2.73	0.00	0.1
ASHTABULA PLANT	0.00	4.07	0.00	0.0	0.00	5.87	0.00	0.0	0.00	8.74	0.00	0.2

Table 4.1; Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Eastern, Alternative 1, Costs, $ MM		Alternative 1, Derate, %		Alternative 2, Costs, $ MM		Alternative 2, Derate, %		Regulation, Costs, $ MM		Regulation, Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
AVON LAKE 5	0.00	0.73	0.00	0.0	0.00	1.09	0.00	0.0	0.00	1.62	0.00	0.1
AVON LAKE 6	0.00	0.73	0.00	0.0	0.00	1.09	0.00	0.0	0.00	1.62	0.00	0.1
AVON LAKE 7	0.00	1.19	0.00	0.0	0.00	1.40	0.00	0.0	0.00	2.99	0.00	0.1
AVON LAKE 8	0.00	4.32	0.00	0.0	0.00	4.70	0.00	0.0	0.00	14.81	0.00	0.2
AVON LAKE PLANT	0.00	6.97	0.00	0.0	0.00	8.28	0.00	0.0	0.00	21.04	0.00	0.2
BAYSHORE 1	0.00	0.00	0.00	0.0	0.00	1.02	0.00	0.0	0.00	2.50	0.00	0.1
BAYSHORE 2	0.00	0.00	0.00	0.0	0.00	1.02	0.00	0.0	0.00	2.50	0.00	0.1
BAYSHORE 3	0.00	0.00	0.00	0.0	0.00	1.09	0.00	0.0	0.00	2.49	0.00	0.1
BAYSHORE 4	0.00	0.00	0.00	0.0	0.00	1.78	0.00	0.0	0.00	4.41	0.00	0.2
BAYSHORE PLANT	0.00	0.00	0.00	0.0	0.00	4.91	0.00	0.0	0.00	11.90	0.00	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern Alternative 1 Costs, $ MM Boiler modification	Alternative 1 Costs, $ MM ESP upgrade	Alternative 1 Derate, % Boiler	Alternative 1 Derate, % ESP	Alternative 2 Costs, $ MM Boiler modification	Alternative 2 Costs, $ MM ESP upgrade	Alternative 2 Derate, % Boiler	Alternative 2 Derate, % ESP	Regulation Costs, $ MM Boiler modification	Regulation Costs, $ MM ESP upgrade	Regulation Derate, % Boiler	Regulation Derate, % ESP
BECKJORD 1	0.00	0.87	0.00	0.0	0.00	1.50	0.00	0.1	0.00	3.58	0.00	0.4
BECKJORD 2	0.00	0.66	0.00	0.0	0.00	0.92	0.00	0.0	0.00	3.86	0.00	0.4
BECKJORD 3	0.00	0.81	0.00	0.0	0.00	1.15	0.00	0.0	0.00	4.42	0.00	0.4
BECKJORD 4	0.00	0.97	0.00	0.0	0.00	1.23	0.00	0.0	0.00	2.40	0.00	0.1
BECKJORD 5	0.00	5.13	0.00	0.0	0.00	6.64	0.00	0.1	0.00	18.68	0.00	0.4
BECKJORD PLANT	0.00	8.44	0.00	0.0	0.00	11.44	0.00	0.1	0.00	29.74	0.00	0.4
BURGER 6	0.00	5.23	0.00	0.0	0.00	5.85	0.00	0.1	0.00	19.15	0.00	0.5
BURGER PLANT	0.00	5.23	0.00	0.0	0.00	5.85	0.00	0.1	0.00	19.15	0.00	0.5

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
CARDINAL 1	0.00	4.06	0.00	0.0	0.00	5.62	0.00	0.1	0.00	15.84	0.0	0.4
CARDINAL 2	0.00	4.06	0.00	0.0	0.00	5.62	0.00	0.1	0.00	15.84	0.0	0.4
CARDINAL PLANT	0.00	8.12	0.00	0.0	0.00	11.24	0.00	0.1	0.00	31.68	0.0	0.4
CLEVELAND MUN. 2	0.00	0.45	0.00	0.0	0.00	0.00	0.50	0.0	0.00	0.58	0.0	0.0
CLEVELAND MUN. 3	0.00	0.45	0.00	0.0	0.00	0.00	0.50	0.0	0.00	0.58	0.0	0.0
CLEVELAND MUN. 4	0.00	0.45	0.00	0.0	0.00	0.00	0.50	0.0	0.00	0.58	0.0	0.0
CLEVELAND MUN. 5	0.00	0.45	0.00	0.0	0.00	0.00	0.50	0.0	0.00	0.58	0.0	0.0
CLEVELAND MUN. 6	0.00	0.86	0.00	0.0	0.00	0.00	0.89	0.0	0.00	1.91	0.0	0.2
CLEVELAND PLANT	0.00	2.66	0.00	0.0	0.00	0.00	2.89	0.0	0.00	4.23	0.0	0.1
CONESVILLE 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.95	0.0	0.2
CONESVILLE 2	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.41	0.0	0.0
CONESVILLE 3	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	8.13	0.0	0.0
CONESVILLE 4	0.00	0.00	0.00	0.0	0.00	0.00	0.97	0.0	0.00	1.10	0.0	0.1
CONESVILLE PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	10.59	0.0	0.02

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
EAST LAKE 1	0.00	0.48	0.00	0.0	0.00	0.52	0.00	0.0	0.00	2.55	0.00	0.2
EAST LAKE 2	0.00	0.80	0.00	0.0	0.00	0.85	0.00	0.0	0.00	2.88	0.00	0.2
EAST LAKE 3	0.00	0.48	0.00	0.0	0.00	0.52	0.00	0.0	0.00	2.55	0.00	0.2
EAST LAKE 4	0.00	0.53	0.00	0.0	0.00	0.67	0.00	0.0	0.00	1.33	0.00	0.0
EAST LAKE 5	0.00	4.54	0.00	0.0	0.00	4.81	0.00	0.0	0.00	13.85	0.00	0.3
EAST LAKE PLANT	0.00	6.83	0.00	0.0	0.00	7.37	0.00	0.0	0.00	20.86	0.00	0.2
EDGEWATER 1	0.00	0.64	0.00	0.0	0.00	0.71	0.00	0.0	0.00	3.06	0.00	0.2
EDGEWATER 2	0.00	0.72	0.00	0.0	0.00	1.01	0.00	0.0	0.00	1.26	0.00	0.0
EDGEWATER PLANT	0.00	1.36	0.00	0.0	0.00	1.72	0.00	0.0	0.00	4.32	0.00	0.1
GAVIN 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	34.01	0.00	0.0
GAVIN PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	34.01	0.00	0.0
GORGE 1	0.00	0.47	0.00	0.0	0.00	0.85	0.00	0.1	0.00	0.89	0.00	0.1
GORGE 2	0.00	0.00	0.00	0.0	0.00	0.88	0.00	0.1	0.00	0.92	0.00	0.1
GORGE PLANT	0.00	0.47	0.00	0.0	0.00	1.73	0.00	0.1	0.00	1.81	0.00	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern Alternative 1 Costs, $ MM: Boiler modification	Alternative 1 Costs, $ MM: ESP upgrade	Alternative 1 Derate, %: Boiler	Alternative 1 Derate, %: ESP	Alternative 2 Costs, $ MM: Boiler modification	Alternative 2 Costs, $ MM: ESP upgrade	Alternative 2 Derate, %: Boiler	Alternative 2 Derate, %: ESP	Regulation Costs, $ MM: Boiler modification	Regulation Costs, $ MM: ESP upgrade	Regulation Derate, %: Boiler	Regulation Derate, %: ESP
KYGER CREEK 1	0.00	0.00	0.00	0.0	0.00	0.97	0.00	0.0	0.00	1.10	0.00	0.0
KYGER CREEK 2	0.00	0.00	0.00	0.0	0.00	1.12	0.00	0.0	0.00	1.77	0.00	0.0
KYGER CREEK 3	0.00	0.00	0.00	0.0	0.00	2.00	0.00	0.0	0.00	3.26	0.00	0.0
KYGER CREEK PLANT	0.00	0.00	0.00	0.0	0.00	4.09	0.00	0.0	0.00	6.13	0.00	0.0
LAKESHORE 1	0.00	0.23	0.00	0.0	0.00	0.24	0.00	0.0	0.00	0.44	0.00	0.0
LAKESHORE 2	0.00	0.23	0.00	0.0	0.00	0.24	0.00	0.0	0.00	0.44	0.00	0.0
LAKESHORE 3	0.00	0.26	0.00	0.0	0.00	0.29	0.00	0.0	0.00	0.52	0.00	0.0
LAKESHORE 4	0.00	0.26	0.00	0.0	0.00	0.29	0.00	0.0	0.00	0.52	0.00	0.0
LAKESHORE 5	0.00	1.00	0.00	0.0	0.00	1.17	0.00	0.0	0.00	7.24	0.00	0.4
LAKESHORE PLANT	0.00	2.78	0.00	0.0	0.00	2.23	0.00	0.0	0.00	9.16	0.00	0.2

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
MIAMI FORT 3	0.00	1.06	0.00	0.0	0.00	2.10	0.00	0.0	0.00	5.42	0.00	0.3
MIAMI FORT 4	0.00	0.98	0.00	0.0	0.00	1.94	0.00	0.0	0.00	5.09	0.00	0.2
MIAMI FORT 5	0.00	4.06	0.00	0.0	0.00	5.62	0.00	0.0	N/A	N/A	N/A	N/A
MIAMI FORT PLANT	0.00	6.10	0.00	0.0	0.00	9.66	0.00	0.0	0.00	10.51	0.00	0.2
MUSKINGUM RIVER 1A	0.00	0.00	0.00	0.0	0.00	9.64	0.00	0.0	0.00	12.39	0.00	0.1
MUSKINGUM RIVER 2	0.00	0.00	0.00	0.0	0.00	2.73	0.00	0.0	0.00	4.76	0.00	0.1
MUSKINGUM RIV. PLT.	0.00	0.00	0.00	0.0	0.00	12.37	0.00	0.0	0.00	17.15	0.00	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern Alternative 1 Costs, $ MM Boiler modification	Alternative 1 Costs, $ MM ESP upgrade	Alternative 1 Derate, % Boiler	Alternative 1 Derate, % ESP	Alternative 2 Costs, $ MM Boiler modification	Alternative 2 Costs, $ MM ESP upgrade	Alternative 2 Derate, % Boiler	Alternative 2 Derate, % ESP	Regulation Costs, $ MM Boiler modification	Regulation Costs, $ MM ESP upgrade	Regulation Derate, % Boiler	Regulation Derate, % ESP
WILES 1	0.00	0.67	0.00	0.0	0.00	1.06	0.00	0.0	0.00	3.31	0.0	0.2
WILES 2	0.00	0.67	0.00	0.0	0.00	1.06	0.00	0.0	0.00	3.31	0.0	0.2
WILES PLANT	0.00	1.34	0.00	0.0	0.00	2.12	0.00	0.0	0.00	6.62	0.0	0.2
NORWALK 4	0.00	0.24	0.00	0.0	0.00	0.25	0.00	0.0	0.00	0.25	0.0	0.0
NORWALK 5	0.00	0.21	0.00	0.0	0.00	0.23	0.00	0.0	0.00	0.24	0.0	0.0
NORWALK PLANT	0.00	0.45	0.00	0.0	0.00	0.48	0.00	0.0	0.00	0.49	0.0	0.0
ORRVILLE 1	0.00	2.05	0.00	0.2	0.00	2.05	0.00	0.2	0.00	2.05	0.0	0.2
ORRVILLE 2	0.00	3.59	0.00	0.2	0.00	3.59	0.00	0.2	0.00	3.59	0.0	0.2
ORRVILLE PLANT	0.00	6.64	0.00	0.2	0.00	6.64	0.00	0.2	0.00	6.64	0.0	0.2

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
PAINESVILLE 1	0.00	4.31	0.00	0.2	0.00	4.31	0.00	0.2	0.00	4.31	0.00	0.2
PAINESVILLE PLANT	0.00	4.31	0.00	0.2	0.00	4.31	0.00	0.2	0.00	4.31	0.00	0.2
PHILO 4	0.00	0.00	0.00	0.0	0.00	0.63	0.00	0.0	0.00	2.36	0.00	0.2
PHILO 5	0.00	0.00	0.00	0.0	0.00	0.82	0.00	0.0	0.00	2.34	0.00	0.1
PHILO 6	0.00	0.00	0.00	0.0	0.00	0.88	0.00	0.0	0.00	2.21	0.00	0.1
PHILO PLANT	0.00	0.00	0.00	0.0	0.00	2.53	0.00	0.0	0.00	6.91	0.00	0.1

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern Alternative 1 Costs, $ MM Boiler modification	Alternative 1 Costs, $ MM ESP upgrade	Alternative 1 Derate, % Boiler	Alternative 1 Derate, % ESP	Alternative 2 Costs, $ MM Boiler modification	Alternative 2 Costs, $ MM ESP upgrade	Alternative 2 Derate, % Boiler	Alternative 2 Derate, % ESP	Regulation Costs, $ MM Boiler modification	Regulation Costs, $ MM ESP upgrade	Regulation Derate, % Boiler	Regulation Derate, % ESP
PICWAY 1	0.00	0.45	0.00	0.0	0.00	0.50	0.00	0.0	0.00	0.58	0.00	0.0
PICWAY 2	0.00	0.45	0.00	0.0	0.00	0.50	0.00	0.0	0.00	0.58	0.00	0.0
PICWAY 3	0.00	0.00	0.00	0.0	0.00	0.85	0.00	0.0	0.00	1.04	0.00	0.0
PICWAY PLANT	0.00	0.90	0.00	0.0	0.00	1.85	0.00	0.0	0.00	2.20	0.00	0.0
PIQUA 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
PIQUA 2	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
PIQUA 3	0.00	0.23	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.46	0.00	0.0
PIQUA 4	0.00	0.23	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.44	0.00	0.0
PIQUA 5	0.00	0.24	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.31	0.00	0.0
PIQUA PLANT	0.00	0.70	0.00	0.0	0.00	0.00	0.00	0.0	0.00	1.19	0.00	0.0

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal											
	Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
POSTON 1	0.00	0.27	0.00	0.0	0.00	0.38	0.00	0.0	0.00	0.79	0.00	0.0
POSTON 2	0.00	0.00	0.00	0.0	0.00	0.52	0.00	0.0	0.00	1.00	0.00	0.0
POSTON PLANT	0.00	0.00	0.00	0.0	0.00	0.90	0.00	0.0	0.00	1.79	0.00	0.0
SAMMIS 1	0.00	3.06	0.00	0.0	0.00	3.18	0.00	0.0	0.00	7.99	0.00	0.2
SAMMIS 2	0.00	3.06	0.00	0.0	0.00	3.18	0.00	0.0	0.00	7.99	0.00	0.2
SAMMIS 3	0.00	5.31	0.00	0.0	0.00	5.44	0.00	0.0	0.00	13.53	0.00	0.3
SAMMIS 4	0.00	3.90	0.00	0.0	0.00	4.03	0.00	0.0	0.00	12.14	0.00	0.2
SAMMIS PLANT	0.00	15.33	0.00	0.0	0.00	15.83	0.00	0.0	0.00	41.63	0.00	0.2

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Eastern, Alternative 1, Costs, $ MM: Boiler modification	Alternative 1, Costs, $ MM: ESP upgrade	Alternative 1, Derate, %: Boiler	Alternative 1, Derate, %: ESP	Alternative 2, Costs, $ MM: Boiler modification	Alternative 2, Costs, $ MM: ESP upgrade	Alternative 2, Derate, %: Boiler	Alternative 2, Derate, %: ESP	Regulation, Costs, $ MM: Boiler modification	Regulation, Costs, $ MM: ESP upgrade	Regulation, Derate, %: Boiler	Regulation, Derate, %: ESP
STUART 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.78	0.00	0.0
STUART 2	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.78	0.00	0.0
STUART 3	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.78	0.00	0.0
STUART 4	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.78	0.00	0.0
STUART PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	3.12	0.00	0.0
TAIT 3	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
TAIT 4	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
TAIT PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0
TIDD 1	0.00	0.47	0.00	0.0	0.00	0.85	0.00	0.0	N/A[a]	N/A[a]	N/A[a]	N/A[a]
TIDD 2	0.00	0.47	0.00	0.0	0.00	0.85	0.00	0.0	N/A[a]	N/A[a]	N/A[a]	N/A[a]
TIDD 3	0.00	0.00	0.00	0.0	0.00	0.88	0.00	0.0	N/A[a]	N/A[a]	N/A[a]	N/A[a]
TIDD PLANT	0.00	0.94	0.00	0.0	0.00	2.58	0.00	0.0	N/A[a]	N/A[a]	N/A[a]	N/A[a]

[a] Eastern coal will not meet 0.8% S regulation.

Table 4.1: Section 3. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal Eastern											
	Alternative 1				Alternative 2				Regulation			
	Costs, $ MM		Derate, %		Costs, $ MM		Derate, %		Costs, $ MM		Derate, %	
	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP	Boiler modification	ESP upgrade	Boiler	ESP
TORONTO 12	0.00	1.43	0.00	0.0	0.00	2.20	0.00	0.0	0.00	2.46	0.00	0.1
TORONTO PLANT	0.00	1.43	0.00	0.0	0.00	2.20	0.00	0.0	0.00	2.46	0.00	0.1
WOODCOCK 1	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.43	0.00	0.0
WOODCOCK 2	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.49	0.00	0.0
WOODCOCK PLANT	0.00	0.00	0.00	0.0	0.00	0.00	0.00	0.0	0.00	0.92	0.00	0.0

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Reserve 150 Btu																	
	Alternative 1						Alternative 2						Regulation					
	Coals, 3 MM			Scrub. 1			Coals, 3 MM			Scrub. 1			Coals, 3 MM			Scrub. 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
ACME 4	0.10	1.700	2.50	0.00	4.4	0.0	0.2	3.1464	5.65	0.00	7.52	0.2	0.21	4.35	6.47	0.00	10.0	0.2
ACME 16	0.10	0.36	1.23	0.00	3.41	0.1	0.10	0.6613	3.17	0.00	6.27	0.4	0.10	0.82	2.85	0.00	8.69	0.4
ACME PLANT	0.10	2.100	3.63	0.00	4.23	0.0	0.21	3.8076	9.23	0.00	7.621	0.2	0.22	5.26	9.32	0.00	10.5	0.2
ASHTABULA 5	0.10	1.160	4.35	0.00	3.0	0.1	0.2	2.160	6.01	0.00	6.94	0.3	0.21	2.94	6.01	0.00	9.4	0.3
ASHTABULA 4	0.10	1.316	1.63	0.00	3.0	0.0	0.2	2.511	2.73	0.00	6.94	0.1	0.21	2.611	3.73	0.00	9.4	0.5
ASHTABULA PLANT	0.2	2.501	0.00	0.00	3.0	0.0	0.22	2.670	0.74	0.00	6.94	0.2	0.24	0.451	0.74	0.00	9.4	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Reserve 150 Btu																	
	Alternative 1						Alternative 2						Regulation					
	Coals, 3 MM			Scrub. 1			Coals, 3 MM			Scrub. 1			Coals, 3 MM			Scrub. 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
AVON LAKE 5	0.10	0.487	1.00	0.00	3.325	0.0	0.19	0.876	1.56	0.00	5.99	0.1	0.19	1.21	2.23	0.00	8.268	0.2
AVON LAKE 6	0.10	0.487	1.00	0.00	3.325	0.0	0.19	0.876	1.56	0.00	5.99	0.1	0.19	1.21	2.23	0.00	8.265	0.2
AVON LAKE 7	0.10	1.5	1.00	0.00	3.0	0.0	0.2	2.67	2.93	0.00	6.749	0.1	0.21	3.35	3.99	0.00	8.498	0.1
AVON LAKE 8	0.21	3.0	4.76	0.00	3.00	0.0	0.23	5.34	10.00	0.00	6.94	0.2	0.26	7.23	16.81	0.00	9.4	0.2
AVON LAKE PLANT	0.34	5.475	0.26	0.00	3.767	0.0	0.37	9.762	20.10	0.00	6.87	0.2	0.31	1.3	22.06	0.00	9.02	0.2
BATAVIA 1	0.10	0.61	1.36	0.00	3.42	0.0	0.19	1.47	2.50	0.00	6.94	0.1	0.20	1.99	3.65	0.00	8.36	0.1
BATAVIA 2	0.19	0.61	1.36	0.00	3.42	0.0	0.19	1.47	2.50	0.00	6.94	0.1	0.20	1.99	3.65	0.00	8.36	0.0
BATAVIA 3	0.19	0.61	1.00	0.00	3.42	0.0	0.19	1.47	2.50	0.00	6.94	0.1	0.20	1.99	3.60	0.00	8.36	0.1
BATAVIA 4	0.10	1.000	0.20	0.00	3.0	0.2	0.20	2.40	6.63	0.00	6.75	0.2	0.21	3.33	6,00	0.00	9,03	0.2
BATAVIA PLANT	0.22	3.034	0.00	0.00	3.55	0.1	0.23	0.90	11.93	0.00	6.00	0.1	0.27	9,3	13,90	0.00	9,00	0.1

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Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western low Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.19	0.60	3.92	0.00	3.92	0.1	0.19	1.314	3.50	0.00	6.745	0.4	0.20	1.032	2.50	0.00	9.41	0.4
[illegible] 2	0.19	0.60	1.25	0.00	3.52	0.1	0.19	1.314	3.96	0.00	6.745	0.4	0.20	1.032	3.96	0.00	9.41	0.4
[illegible] 3	0.19	0.75	2.07	0.00	3.52	0.1	0.19	1.434	4.42	0.00	6.745	0.4	0.20	2.0	4.42	0.00	9.41	0.4
[illegible] 4	0.19	0.973	1.27	0.00	3.52	0.0	0.20	1.68	2.40	0.00	6.745	0.1	0.202	2.68	2.40	0.00	9.41	0.1
[illegible] 5	0.21	4.92	7.81	0.00	0.46	0.1	0.24	5.14	10.60	0.00	6.745	0.4	0.27	7.17	10.60	0.00	9.41	0.4
[illegible] PLANT	0.25	0.0	16.42	0.00	3.10	0.1	0.29	11.00	32.94	0.00	6.745	0.4	0.252	15.43	32.94	0.00	9.41	0.4
[illegible] 6	0.20	2.344	5.04	0.00	2.0	0.1	0.22	6.22	10.63	0.00	6.04	0.0	0.24	0.0	10.14	0.00	9.41	0.0
[illegible] PLANT	0.20	2.344	5.04	0.00	2.0	0.1	0.22	6.22	10.63	0.00	6.04	0.0	0.24	0.0	10.14	0.00	9.41	0.0

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western low Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.21	1.305	3.68	0.00	3.61	0.1	0.23	2.251	0.61	0.00	6.75	0.3	0.26	3.16	15.04	0.00	9.41	0.4
[illegible] 2	0.21	1.305	3.68	0.00	3.61	0.1	0.23	2.251	0.61	0.00	6.75	0.3	0.26	3.16	15.04	0.00	9.41	0.4
[illegible] PLANT	0.24	2.41	11.36	0.00	3.61	0.1	0.28	4.102	17.22	0.00	6.75	0.6	0.34	6.20	31.68	0.00	9.41	0.6
[illegible] 3	0.19	0.23	0.49	0.0	3.0	0.0	0.20	0.47	0.50	0.00	5.6	0.0	0.20	0.50	0.50	0.00	7.7	0.0
[illegible] 4	0.19	0.23	0.49	0.0	3.0	0.0	0.20	0.47	0.50	0.00	5.6	0.0	0.20	0.50	0.50	0.00	7.7	0.0
[illegible] 5	0.19	0.23	0.49	0.0	3.0	0.0	0.20	0.47	0.50	0.00	5.6	0.0	0.20	0.50	0.50	0.00	7.7	0.0
[illegible] 6	0.19	0.36	1.52	0.0	3.0	0.1	0.19	0.66	1.75	0.00	6.3	0.4	0.19	0.93	2.95	0.00	8.7	0.4
[illegible] PLANT	0.24	1.34	3.48	0.0	3.1	0.0	0.19	2.54	5.17	0.00	6.3	0.3	0.20	3.24	9.17	0.00	8.8	0.2
[illegible] 1	0.19	1.00	0.98	0.00	2.97	0.0	0.20	1.77	2.06	0.00	4.04	0.0	0.20	2.410	2.10	0.00	6.0	0.0
[illegible] 2	0.19	0.98	0.39	0.00	2.97	0.0	0.19	0.69	0.62	0.00	4.04	0.3	0.20	1.212	1.17	0.00	6.0	0.0
[illegible] 3	0.21	2.26	6.74	0.00	2.97	0.1	0.23	3.72	7.37	0.00	4.04	0.0	0.24	5.00	0.29	0.00	6.0	0.1
[illegible] 4	0.22	3.03	1.09	0.0	3.1	0.0	0.23	0.11	1.10	0.00	6.2	0.0	0.29	0.42	1.34	0.0	6.1	0.0
[illegible] PLANT	0.23	3.98	9.12	0.00	2.97	0.1	0.25	6.36	11.23	6.00	6.04	0.0	0.32	0.71	13.84	0.00	6.0	0.1

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western Low Btu												Regulation					
	Alternative 1						Alternative 2						Costs, $ MM			Derate, %		
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %								
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
EAST LAKE 1	0.19	0.71	1.01	0.00	3.42	0.0	0.19	1.31	1.41	0.00	6.27	0.2	0.20	1.702	2.55	0.00	8.55	0.2
EAST LAKE 2	0.19	0.71	1.01	0.00	3.42	0.0	0.19	1.31	2.47	0.00	6.27	0.2	0.20	1.702	2.55	0.00	8.55	0.2
EAST LAKE 3	0.19	0.71	1.01	0.00	3.42	0.0	0.19	1.31	2.47	0.00	6.27	0.2	0.20	1.702	2.55	0.00	8.55	0.2
EAST LAKE 4	0.19	1.34	0.56	0.00	3.8	0.0	0.20	2.345	1.03	0.00	6.65	0.0	0.21	3.183	1.59	0.00	9.025	0.0
EAST LAKE 5	0.21	2.869	4.98	0.00	3.8	0.0	0.24	5.34	13.03	0.00	6.94	0.3	0.26	7.34	13.03	0.00	9.41	0.3
EAST LAKE PLANT	0.25	6.457	6.91	0.00	3.74	0.0	0.29	11.02	22.27	0.00	6.7	0.2	0.35	15.77	23.07	0.00	9.69	0.2
EDGEWATER 1	0.19	1.168	1.56	0.00	3.705	0.0	0.19	1.99	1.62	0.00	6.65	0.0	0.19	2.78	2.86	0.00	9.63	0.2
EDGEWATER 2	0.19	0.552	1.02	0.00	3.53	0.0	0.19	1.08	2.04	0.00	6.66	0.1	0.19	1.48	3.08	0.00	8.36	0.2
EDGEWATER PLANT	0.2	1.7	0.78	0.00	3.56	0.0	0.2	2.07	4.46	0.00	6.66	0.0	0.2	4.19	6.14	0.00	8.78	0.2
GAVIN 1	0.22	4.752	36.39	0.00	4.655	0.0	0.27	9.503	31.68	0.00	3.23	0.0	0.31	13.7	41.92	0.00	4.656	0.0
GAVIN PLANT	0.22	4.752	36.39	0.00	4.655	0.0	0.27	9.503	31.68	0.00	3.23	0.0	0.31	13.7	41.92	0.00	4.656	0.0
GORGE 1	0.18	0.227	0.69	0.00	3.64	0.0	0.19	0.43	0.56	0.00	6.61	0.1	0.19	0.5822	3.25	0.00	7.79	0.6
GORGE 2	0.18	0.227	0.68	0.00	3.64	0.0	0.19	0.43	1.17	0.00	6.61	0.1	0.19	0.5822	3.88	0.00	7.79	0.6
GORGE PLANT	0.18	0.454	1.36	0.00	3.64	0.0	0.2	0.84	3.13	0.00	6.61	0.1	0.2	1.1644	9.13	0.00	7.79	0.5

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western Low Btu												Regulation					
	Alternative 1						Alternative 2						Costs, $ MM			Derate, %		
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %								
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
HYGEN CREEK 1	0.19	0.99	1.09	0.00	3.87	0.0	0.20	1.87	1.10	0.00	3.52	0.0	0.20	2.74	1.34	0.00	5.17	0.0
HYGEN CREEK 2	0.19	2.349	1.66	0.00	7.37	0.0	0.20	1.12	2.10	0.00	3.52	0.0	0.19	1.648	2.69	0.00	5.17	0.1
HYGEN CREEK 3	0.19	0.491	2.57	0.00	1.67	0.0	0.20	1.87	2.93	0.00	3.52	0.0	0.20	2.73	3.88	0.00	5.17	0.1
HYGEN CREEK PLANT	0.21	4.326	5.95	0.00	2.97	0.0	0.24	4.86	6.30	0.00	3.52	0.0	0.33	7.11	7.90	0.00	5.12	0.1
LAKESHORE 1	0.18	0.146	0.35	0.00	1.65	0.0	0.18	0.44	0.75	0.00	6.85	0.1	0.19	0.48	1.85	0.00	7.81	0.2
LAKESHORE 2	0.18	0.146	0.35	0.00	1.65	0.0	0.18	0.44	0.75	0.00	6.85	0.1	0.19	0.48	1.85	0.00	7.81	0.2
LAKESHORE 3	0.18	0.189	0.55	0.00	1.67	0.0	0.19	0.533	0.72	0.00	3.30	0.0	0.19	0.82	1.22	0.00	8.14	0.1
LAKESHORE 4	0.18	0.188	0.55	0.00	1.67	0.0	0.19	0.533	0.72	0.00	3.30	0.0	0.19	0.873	1.22	0.00	8.25	0.1
LAKESHORE 5	0.19	0.939	6.89	0.00	2.97	0.0	0.20	2.236	7.32	0.00	7.15	0.3	0.21	3.37	7.32	0.00	7.59	0.3
LAKESHORE PLANT	0.19	1.599	6.69	0.00	2.97	0.0	0.21	4.18	10.14	0.00	2.43	0.2	0.25	5.403	10.16	0.00	7.8	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western low Btu												Regulation					
	Alternative 1						Alternative 2						Costs, $ MM			Derate, %		
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %								
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
MIAMI FORT 3	0.19	1.76	2.10	0.00	4.4	0.0	0.20	3.160	4.60	0.00	7.92	0.2	0.21	4.356	6.12	0.00	10.9	0.2
MIAMI FORT 4	0.21	1.664	1.94	0.00	4.4	0.0	0.24	1.951	3.33	0.00	7.92	0.2	0.26	2.68	3.47	0.00	10.9	0.4
MIAMI FORT 5	0.26	1.26	1.60	0.0	3.6	0.1	0.20	2.30	15.64	0.0	6.0	0.4	0.21	3.19	10.06	0.00	9.4	0.4
MIAMI FORT PLANT	0.29	4.69	9.72	0.00	4.4	0.1	0.31	7.42	23.85	0.00	7.41	0.3	0.35	10.23	29.65	0.00	10.4	0.4
MUSKINGUM REV. 1A	0.21	7.82	9.04	0.00	7.09	0.0	0.24	5.64	12.62	0.00	5.69	0.1	0.27	8.0	24.70	0.00	9.366	0.3
MUSKINGUM REV. 2	0.26	2.1	2.87	0.00	3.14	0.0	0.23	3.04	4.71	0.00	5.69	0.1	0.25	5.52	16.76	0.00	0.366	0.4
MUSKINGUM REV. PLT.	0.23	9.92	12.79	0.00	5.58	0.0	0.29	9.78	17.33	0.00	5.69	0.1	0.34	13.72	41.46	0.00	0.365	0.3

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western [illegible] Btu												Regulation					
	Alternative 1						Alternative 2						Costs, $ MM			Derate, %		
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %								
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
ZILES 1	0.19	0.73	1.06	0.00	1.12	0.0	0.19	1.33	2.50	0.00	6.27	0.1	0.20	1.86	3.03	0.00	0.74	0.2
ZILES 2	0.19	0.73	1.06	0.00	1.12	0.0	0.19	1.33	2.50	0.00	6.27	0.1	0.20	1.86	3.03	0.00	0.74	0.2
ZILES PLANT	0.20	1.46	2.12	0.00	1.43	0.0	0.20	2.66	5.16	0.00	6.27	0.1	0.22	3.72	5.66	0.00	0.74	0.2
MORGAN 4	0.17	0.03	0.31	0.00	1.43	0.0	0.17	0.05	0.21	0.00	2.64	0.0	0.18	0.07	0.33	0.00	3.03	0.1
MORGAN 5	0.17	0.04	0.29	0.00	2.64	0.0	0.17	0.072	0.26	0.00	2.64	0.0	0.18	0.108	0.38	0.00	3.05	0.1
MORGAN PLANT	0.17	0.07	0.60	0.00	3.14	0.0	0.17	0.122	0.48	0.00	2.64	0.0	0.20	0.112	0.71	0.00	3.05	0.1
GRANVILLE 1	0.12	0.21	0.32	0.0	3.2	0.0	0.14	0.53	0.33	0.00	7.0	0.0	0.14	0.75	0.38	0.0	10.9	0.0
GRANVILLE 2	0.13	0.31	0.40	0.0	3.6	0.0	0.17	0.83	0.91	0.00	7.1	0.0	0.19	0.75	1.73	0.0	9.0	0.2
GRANVILLE PLANT	0.14	0.42	0.80	0.0	3.7	0.0	0.18	1.06	1.34	0.00	7.0	0.0	0.16	14.19	2.11	0.0	10.2	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western low Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Scrub. $			Costs, $ MM			Scrub. $			Costs, $ MM			Scrub. $		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
PAINESVILLE 1	0.17	0.18	0.99	0.0	4.0	0.0	0.19	0.31	0.66	0.00	7.1	0.0	0.21	0.55	0.70	0.0	10.3	0.0
PAINESVILLE PLANT	0.17	0.18	0.99	0.0	4.0	0.0	0.19	0.31	0.66	0.00	7.1	0.0	0.21	0.55	0.70	0.0	10.3	0.0
FIELD 4	0.19	1.07	0.83	0.00	3.705	0.0	0.10	1.07	1.20	0.00	6.04	0.1	0.24	2.71	2.26	0.00	9.665	0.1
FIELD 5	0.19	1.07	0.82	0.00	3.705	0.0	0.10	1.07	1.26	0.00	6.04	0.1	0.24	2.71	2.34	0.00	9.665	0.2
FIELD 6	0.19	0.704	0.69	0.00	3.705	0.0	0.20	1.09	2.15	0.00	6.00	0.1	0.25	1.09	3.31	0.00	9.665	0.1
FIELD PLANT	0.10	2.934	2.53	0.00	3.705	0.0	0.30	0.33	0.91	0.00	6.12	0.1	0.20	7.41	6.91	0.00	9.665	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western low Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Scrub. $			Costs, $ MM			Scrub. $			Costs, $ MM			Scrub. $		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
PICWAY 1	0.10	0.06	0.49	0.00	2.53	0.0	0.10	0.11	0.00	0.00	2.53	0.0	0.10	0.163	0.56	0.00	3.76	0.0
PICWAY 2	0.10	0.06	0.45	0.00	2.53	0.0	0.10	0.11	0.00	0.00	2.53	0.0	0.10	0.163	0.56	0.00	3.76	0.0
PICWAY 3	0.10	0.164	0.00	0.00	1.20	0.0	0.10	0.315	0.00	0.00	3.53	0.0	0.10	0.466	1.01	0.00	3.76	0.0
PICWAY PLANT	0.10	0.304	0.94	0.00	1.01	0.0	0.10	0.535	1.01	0.00	2.53	0.0	0.10	0.793	2.20	0.00	3.76	0.0
PICUA 1	0.10	0.233	0.00	0.00	2.00	0.0	0.10	0.435	0.00	0.00	2.0	0.0	0.10	0.01	0.00	0.00	0.01	0.0
PICUA 2	0.10	0.117	0.00	0.00	2.00	0.00	0.10	0.22	0.00	0.00	2.0	0.0	0.10	0.307	0.00	0.00	0.01	0.1
PICUA 3	0.10	0.117	0.31	0.00	2.00	0.00	0.10	0.22	0.34	0.00	2.0	0.0	0.10	0.307	0.00	0.00	0.01	0.1
PICUA 4	0.10	0.117	0.31	0.00	2.00	0.0	0.10	0.22	0.34	0.00	2.0	0.0	0.10	0.307	0.00	0.00	0.01	0.1
PICUA 5	0.10	0.07	0.32	0.00	2.00	0.0	0.10	0.131	0.36	0.00	2.0	0.0	0.10	0.186	0.70	0.00	0.01	0.1
PICUA PLANT	0.10	0.656	0.94	0.00	2.00	0.0	0.10	1.336	1.04	0.00	2.0	0.0	0.10	1.717	2.07	0.00	0.01	0.1

Table 4-1; Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending, Western low Btu																	
	Alternative 1						Alternative 2						Emulsion					
	Costs, $ MM			[illegible]			Costs, $ MM			[illegible]			Costs, $ MM			[illegible]		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
POSTON 1	0.18	0.25	0.51	0.00	2.09	0.0	0.19	0.45	0.51	0.00	3.94	0.0	0.18	0.348	0.75	0.00	2.07	0.0
POSTON 2	0.19	0.387	0.52	0.00	2.09	0.0	0.19	0.91	0.51	0.00	5.17	0.0	0.19	0.00	2.67	0.00	0.00	0.1
POSTON PLANT	0.19	0.617	1.32	0.00	2.09	0.0	0.20	1.37	1.38	0.00	4.69	0.0	0.20	0.348	3.42	0.00	2.07	0.1
SAMMIS 1	0.20	1.99	3.43	0.00	3.0	0.0	0.21	3.50	7.99	0.00	6.04	0.1	0.23	6.03	7.99	0.00	9.005	0.2
SAMMIS 2	0.20	1.99	7.43	0.00	3.0	0.0	0.21	3.50	7.99	0.00	6.04	0.1	0.23	6.03	7.99	0.00	9.005	0.2
SAMMIS 3	0.22	4.048	5.41	0.00	3.0	0.0	0.38	7.29	13.13	0.00	6.04	0.1	0.30	10.02	13.33	0.00	9.005	0.2
SAMMIS 4	0.21	2.60	4.29	0.00	3.0	0.0	0.23	8.83	13.14	0.00	6.04	0.1	0.26	6.43	13.14	0.00	9.005	0.2
SAMMIS PLANT	0.29	10.71	16.80	0.00	3.0	0.0	0.27	21.3	41.68	0.00	6.04	0.1	0.68	26.48	41.68	0.00	9.005	0.2

Table 4-1; Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending, Western low Btu																	
	Alternative 1						Alternative 2						Emulsion					
	Costs, $ MM			[illegible]			Costs, $ MM			[illegible]			Costs, $ MM			[illegible]		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
STUART 1	0.10	1.64	1.06	0.00	2.375	0.0	0.19	3.018	1.36	0.00	4.37	0.0	0.19	4.00	3.16	0.00	6.37	0.1
STUART 2	0.10	1.64	1.06	0.00	2.375	0.0	0.19	3.018	1.36	0.00	4.37	0.0	0.20	4.00	3.16	0.00	6.37	0.1
STUART 3	0.10	1.64	1.06	0.00	2.375	0.0	0.19	3.018	1.36	0.00	4.37	0.0	0.19	4.00	3.16	0.00	6.37	0.1
STUART 4	0.10	1.64	1.06	0.00	2.375	0.0	0.19	3.018	1.36	0.00	4.37	0.0	0.19	4.00	3.16	0.00	6.37	0.1
STUART PLANT	0.33	6.56	4.24	0.00	2.375	0.0	0.33	12.07	5.44	0.00	4.37	0.0	0.33	17.6	12.64	0.00	6.37	0.1
TAIT 3				0.00						0.00						0.00		
TAIT 4				0.00						0.00						0.00		
TAIT PLANT				0.00						0.00						0.00		
TIDD 1	0.18	0.23	0.09	0.0	3.0	0.0	0.19	0.43	0.91	0.00	5.4	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TIDD 2	0.18	0.23	0.09	0.0	3.0	0.0	0.19	0.43	0.91	0.00	5.4	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TIDD 3	0.19	0.73	0.88	0.0	3.4	0.0	0.19	1.33	2.18	0.00	6.3	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TIDD PLANT	0.18	1.19	2.66	0.0	3.2	0.0	0.19	2.17	2.67	0.00	5.9	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Western coal will not meet 0.8% S regulation.

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant Identification	Coal Blending Western Low Sta																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Costs, %			Costs, $ MM			Costs, %			Costs, $ MM			Costs, %		
	Blending facility	Boiler modification	LSP upgrade	Blending facility	Boiler modification	LSP upgrade	Blending facility	Boiler modification	LSP upgrade	Blending facility	Boiler modification	LSP upgrade	Blending facility	Boiler modification	LSP upgrade	Blending facility	Boiler modification	LSP upgrade
[illegible] 12	0.10	0.76	2.50	0.00	2.[illegible]	0.1	0.20	1.44	2.63	0.00	4.04	0.1	0.20	2.04	5.47	0.00	6.04	0.1
[illegible] PLANT	0.10	2.03	2.50	0.00	6.03	0.1	0.20	1.44	2.63	0.00	4.04	0.1	0.20	2.04	5.47	0.00	6.04	0.1
[illegible] 1				0.00						0.00	0.00			0.00	5.27	0.00	0.00	0.1
[illegible] 2				0.00						0.00	0.00			0.00	4.00	0.00	0.00	0.1
[illegible] PLANT				0.00						0.00	0.00			0.00	11.07	0.00	0.00	0.1

Plant identification	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 4	0.10	0.00	0.00	0.00	2.87	0.0	0.10	0.00	3.24	0.00	0.84	0.0	0.20	0.00	5.27	0.00	0.22	0.2
[illegible] 10	0.10	0.00	0.00	0.00	1.90	0.0	0.10	0.00	0.10	0.00	4.03	0.0	0.10	0.00	1.01	0.00	0.10	0.0
[illegible] PLANT	0.10	0.00	0.00	0.00	2.00	0.0	0.10	0.00	4.33	0.00	5.27	0.0	0.21	0.00	7.50	0.00	0.10	0.0
[illegible] 5	0.10	0.00	3.23	0.00	0.00	0.0	0.10	0.00	4.30	0.00	0.00	0.1	0.20	0.00	6.01	0.00	0.00	0.0
[illegible] 6	0.10	0.00	1.23	0.00	0.00	0.0	0.10	0.00	1.63	0.00	0.00	0.0	0.20	0.00	2.73	0.00	0.00	0.1
[illegible] PLANT	0.20	0.00	4.60	0.00	0.00	0.0	0.20	0.00	5.07	0.00	0.30	0.0	0.20	0.00	5.74	0.00	0.00	0.2

Table 4-1: Section 4. [illegible] FOR SO_2 CONTROL [illegible] POWER PLANTS

Plant identification	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
AVON LAKE 5	0.10	0.00	0.75	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.00	0.0	0.10	0.00	1.70	0.00	0.00	0.1
AVON LAKE 6	0.10	0.00	0.75	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.00	0.0	0.10	0.00	1.70	0.00	0.00	0.1
AVON LAKE 7	0.10	0.00	1.20	0.00	0.00	0.0	0.10	0.00	2.03	0.00	0.00	0.1	0.20	0.00	2.00	0.00	0.00	0.1
AVON LAKE 8	0.20	0.00	4.23	0.00	0.00	0.0	0.21	0.00	4.00	0.00	0.00	0.0	0.23	0.00	4.21	0.00	0.00	0.0
AVON LAKE PLANT	0.21	0.00	7.11	0.00	0.00	0.0	0.24	0.00	8.33	0.00	0.00	0.0	0.27	0.00	10.00	0.00	0.00	0.0
[illegible] 1	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.00	0.0	0.10	0.00	2.00	0.00	0.00	0.1
[illegible] 2	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.00	0.0	0.10	0.00	2.30	0.00	0.00	0.1
[illegible] 3	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.14	0.00	0.00	0.0	0.13	0.00	2.40	0.00	0.00	0.1
[illegible] 4	0.19	0.00	0.00	0.00	0.00	0.0	0.19	0.00	1.07	0.00	0.00	0.0	0.20	0.00	4.41	0.00	0.00	0.2
[illegible] PLANT	0.10	0.00	0.00	0.00	0.00	0.0	0.18	0.00	5.17	0.00	0.00	0.0	0.23	0.00	11.00	0.00	0.00	0.1

Table 4-1; Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending — Western high Btu — Alternative 1 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade	Regulation — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.18	0.00	0.95	0.00	0.00	0.0	0.19	0.00	2.01	0.00	0.00	0.1	0.19	0.00	3.00	0.00	0.00	0.4
[illegible] 2	0.18	0.00	0.71	0.00	0.00	0.0	0.19	0.00	1.03	0.00	0.00	0.0	0.19	0.00	3.00	0.00	0.00	0.4
[illegible] 3	0.19	0.00	0.96	0.00	0.00	0.0	0.19	0.00	1.19	0.00	0.00	0.0	0.19	0.00	4.42	0.00	0.00	0.4
[illegible] 4	0.19	0.00	1.00	0.00	0.00	0.0	0.19	0.00	1.42	0.00	0.00	0.0	0.19	0.00	3.00	0.00	0.00	0.3
[illegible] 5	0.20	0.00	4.09	0.00	0.00	0.0	0.22	0.00	6.01	0.00	0.00	0.1	0.26	0.00	10.60	0.00	0.00	0.4
[illegible] PLANT	0.22	0.00	8.41	0.00	0.00	0.0	0.26	0.00	12.45	0.00	0.00	0.1	0.30	0.00	22.04	0.00	0.00	0.4
[illegible] 6	0.19	0.00	3.36	0.00	0.00	0.0	0.21	0.00	5.56	0.00	0.00	0.1	0.23	0.00	10.15	0.00	0.00	0.0
[illegible] PLANT	0.19	0.00	3.36	0.00	0.00	0.0	0.21	0.00	5.56	0.00	0.00	0.1	0.23	0.00	10.15	0.00	0.00	0.0

Table 4-1; Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending — Western high Btu — Alternative 1 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade	Regulation — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Energy, %: Blending facility	Boiler modification	ESP upgrade
CARDINAL 1	0.20	0.00	4.27	0.00	0.00	0.0	0.21	0.00	5.68	0.00	0.00	0.1	0.23	0.00	15.84	0.00	0.00	0.4
CARDINAL 2	0.20	0.00	4.27	0.00	0.00	0.0	0.21	0.00	5.68	0.00	0.00	0.1	0.21	0.00	15.84	0.00	0.00	0.4
CARDINAL PLANT	0.22	0.00	8.54	0.00	0.00	0.0	0.24	0.00	11.36	0.00	0.00	0.1	0.28	0.00	31.68	0.00	0.00	0.4
CLEVELAND 2	0.19	0.00	0.00	0.0	0.00	0.0	0.19	0.00	0.00	0.00	0.00	0.0	0.20	0.00	0.00	0.00	0.00	0.0
CLEVELAND 3	0.19	0.00	0.00	0.0	0.00	0.0	0.19	0.00	0.00	0.00	0.00	0.0	0.20	0.00	0.00	0.00	0.00	0.0
CLEVELAND 4	0.19	0.00	0.00	0.0	0.00	0.0	0.19	0.00	0.00	0.00	0.00	0.0	0.20	0.00	0.00	0.00	0.00	0.0
CLEVELAND 5	0.19	0.00	0.00	0.0	0.00	0.0	0.19	0.00	0.00	0.00	0.00	0.0	0.20	0.00	0.00	0.00	0.00	0.0
CLEVELAND 6	0.18	0.00	0.00	0.0	0.00	0.0	0.18	0.00	0.00	0.00	0.40	0.0	0.19	0.00	2.77	0.00	0.00	0.2
CLEVELAND PLANT	0.18	0.00	0.00	0.0	0.00	0.0	0.18	0.00	0.00	0.00	0.00	0.0	0.20	0.00	2.72	0.00	0.00	0.1
CONESVILLE 1	0.19	0.00	0.00	0.0	1.00	0.0	0.19	0.00	0.00	0.00	3.25	0.0	0.19	0.00	1.14	0.00	0.00	0.1
CONESVILLE 2	0.19	0.00	0.00	0.0	1.00	0.0	0.19	0.00	0.53	0.00	3.25	0.0	0.19	0.00	0.54	0.00	0.00	0.0
CONESVILLE 3	0.20	0.00	0.00	0.0	1.00	0.0	0.21	0.00	0.00	0.00	3.25	0.0	0.19	0.00	0.00	0.00	0.00	0.0
CONESVILLE 4	0.21	0.00	0.00	0.0	0.00	0.0	0.23	0.00	0.77	0.00	0.00	0.0	0.20	0.00	1.12	0.00	0.00	0.0
CONESVILLE PLANT	0.20	0.00	0.00	0.0	1.00	0.0	0.23	0.00	1.30	0.00	3.25	0.0	0.26	0.00	9.56	0.00	0.00	0.0

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Table 4-1: Section 4. [illegible] FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal Fired Boilers Subject to BACT																	
	Alternative 1						Alternative 2						Alternative 3					
	Scrub. 1.2# Boiler			Scrub. 1 Boiler			Scrub. 1.2# Boiler			Scrub. 1 Boiler			Scrub. 1.2# Boiler			Scrub. 1 Boiler		
	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.0	0.0	0.10	0.00	0.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.07	0.00	0.0	0.0	0.10	0.00	0.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.0	0.0	0.10	0.00	0.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	0.07	0.00	0.0	0.0	0.10	0.00	1.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	7.00	0.00	0.0	0.0	0.10	0.00	11.00	0.00	0.0	0.0
[illegible]	0.21	0.00	0.70	0.00	0.00	0.0	0.21	0.00	11.17	0.00	0.0	0.0	0.20	0.00	30.07	0.00	0.0	0.0
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	0.71	0.00	0.0	0.0	0.10	0.00	3.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.70	0.00	0.00	0.0	0.10	0.00	1.00	0.00	0.0	0.0	0.10	0.00	1.00	0.00	0.0	0.0
[illegible]	0.10	0.00	1.40	0.00	0.00	0.0	0.20	0.00	1.72	0.00	0.0	0.0	0.20	0.00	4.24	0.00	0.0	0.1
[illegible]	0.21	0.00	0.00	0.00	0.00	0.0	0.21	0.00	0.00	0.00	0.0	0.0	0.20	0.00	30.00	0.00	0.0	0.0
[illegible]	0.21	0.00	0.00	0.00	0.00	0.0	0.21	0.00	0.00	0.00	0.0	0.0	0.20	0.00	30.00	0.00	0.0	0.0
[illegible]	0.10	0.00	0.07	0.00	0.00	0.0	0.10	0.00	0.07	0.00	0.0	0.1	0.10	0.00	0.00	0.00	0.0	0.1
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	0.00	0.00	0.0	0.1	0.10	0.00	0.00	0.00	0.0	0.1
[illegible]	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.10	0.00	0.0	0.1	0.00	0.00	1.00	0.00	0.0	0.1

Table 4-1: Section 4. [illegible] SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal Fired Boilers Subject to BACT																	
	Alternative 1						Alternative 2						Alternative 3					
	Scrub. 1.2# Boiler			Scrub. 1 Boiler			Scrub. 1.2# Boiler			Scrub. 1 Boiler			Scrub. 1.2# Boiler			Scrub. 1 Boiler		
	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade	Existing Facility	Boiler Modification	New Upgrade
[illegible]	0.10	0.00	0.00	0.00	1.00	0.00	0.10	0.00	0.07	0.00	0.01	0.0	0.00	0.00	1.12	0.00	0.00	0.0
[illegible]	0.10	0.00	0.00	0.00	1.00	0.00	0.10	0.00	1.12	0.00	0.01	0.0	0.10	0.00	1.70	0.00	0.00	0.0
[illegible]	0.10	0.00	0.00	0.00	1.00	0.00	0.10	0.00	0.00	0.00	0.01	0.0	0.00	0.00	0.02	0.00	0.00	0.0
[illegible]	0.10	0.00	0.00	0.00	1.00	0.00	0.11	0.00	0.07	0.00	0.01	0.0	0.11	0.00	0.11	0.00	0.00	0.0
[illegible]	0.10	0.00	0.01	0.00	0.00	0.0	0.10	0.00	0.01	0.00	0.00	0.0	0.10	0.00	0.01	0.00	0.10	0.0
[illegible]	0.10	0.00	0.01	0.00	0.00	0.0	0.10	0.00	0.01	0.00	0.00	0.0	0.10	0.00	0.01	0.00	0.10	0.0
[illegible]	0.10	0.00	0.07	0.00	1.00	0.0	0.10	0.00	0.00	0.00	0.01	0.0	0.10	0.00	0.04	0.00	0.07	0.0
[illegible]	0.10	0.00	0.07	0.00	1.00	0.1	0.10	0.00	0.00	0.00	0.01	0.0	0.10	0.00	0.00	0.00	0.07	0.0
[illegible]	0.10	0.00	0.00	0.00	1.00	0.0	0.10	0.00	1.04	0.00	0.07	0.0	0.00	0.00	1.04	0.00	0.70	0.0
[illegible]	0.10	0.00	0.01	0.00	1.11	0.0	0.10	0.00	0.00	0.00	0.00	0.0	0.00	0.00	0.10	0.00	0.01	0.0

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible]	0.10	0.00	1.00	0.00	2.70	0.0	0.10	0.00	2.10	0.00	5.75	0.0	0.20	0.0	9.34	0.00	0.01	0.2
[illegible]	0.20	0.00	1.00	0.00	2.70	0.0	0.21	0.00	1.04	0.00	6.01	0.0	0.23	0.0	5.09	0.00	0.01	0.2
[illegible]	0.25	0.00	0.27	0.00	0.00	0.0	0.26	0.00	5.00	0.00	0.00	0.1	0.25	0.0	15.04	0.00	0.00	0.4
[illegible]	0.20	0.00	0.36	0.00	1.03	0.0	0.31	0.00	9.72	0.00	6.01	0.0	0.25	0.0	36.17	0.00	7.13	0.2
[illegible]	0.2	0.00	0.00	0.00	0.00	0.0	0.22	0.00	9.77	0.00	0.00	0.1	0.23	0.0	12.45	0.00	0.00	0.0
[illegible]	0.20	0.00	0.00	0.00	0.00	0.0	0.21	0.00	2.02	0.00	0.00	0.1	0.23	0.0	4.16	0.00	0.00	0.0
[illegible]	0.25	0.00	0.00	0.00	0.00	0.0	0.25	0.00	13.99	0.00	0.00	0.1	0.27	0.0	16.61	0.00	0.00	0.0

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.04	0	0.00	0.0	0.10	0	2.76	0	0.00	0.2
[illegible] 2	0.10	0.00	0.00	0.00	0.00	0.0	0.10	0.00	1.04	0	0.00	0.0	0.10	0	2.76	0	0.00	0.2
[illegible] PLANT	0.10	0.00	1.20	0.00	0.00	0.0	0.20	0.00	2.12	0	0.00	0.0	0.20	0	5.52	0	0.00	0.2
[illegible] 4	0.16	0.00	0.24	0.00	0.00	0.0	0.17	0.00	0.25	0	0.16	0.0	0.10	0	0.25	0	0.24	0.0
[illegible] 5	0.16	0.00	0.00	0.00	0.00	0.0	0.17	0.00	0.24	0	0.16	0.0	0.10	0	0.25	0	0.24	0.0
[illegible] PLANT	0.32	0.00	0.24	0.00	0.00	0.0	0.17	0.00	0.49	0	0.16	0.0	0.10	0	0.50	0	0.24	0.0
[illegible] 1	0.13	0.00	0.33	0.00	0.10	0.2	0.15	0.00	0.04	0	0.2		0.17	0	0.09	0	0.40	0.2
[illegible] 2	0.15	0.00	0.04	0.00	0.10	0.2	0.16	0.00	2.02	0	0.2		0.20	0	2.01	0	0.40	0.2
[illegible] PLANT	0.10	0.00	1.27	0.00	0.10	0.2	0.16	0.00	3.01	0	0.2		0.17	0	3.01	0	0.40	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu — Alternative 1 — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade	Alternative 2 — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade	Scrubber — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade
PARKERSBURG 1	0.17	0.00	1.40	0.0	0.0	0.2	0.10	0.1	2.70	0.0	0.0	0.2	0.30	0.10	4.00	0.0	0.0	0.2
PARKERSBURG PLANT	0.17	0.00	1.40	0.0	0.0	0.2	0.10	0.1	2.70	0.0	0.0	0.2	0.30	0.10	4.00	0.0	0.0	0.2
PICWAY 4	0.10	0.00	0.0	0.0	0.0	0.0	0.10	0.0	0.03	0.0	0.0	0.0	0.30	0.00	2.36	0.0	0.0	0.2
PICWAY 5	0.10	0.00	0.0	0.0	0.0	0.0	0.10	0.0	0.03	0.0	0.0	0.0	0.30	0.00	2.36	0.0	0.0	0.2
PICWAY 6	0.10	0.00	0.03	0.0	0.0	0.0	0.10	0.0	0.03	0.0	0.0	0.0	0.22	0.00	0.21	0.0	0.0	0.1
PICWAY PLANT	0.10	0.00	7.77	0.0	0.0	0.0	0.10	0.0	3.04	0.0	0.0	0.0	0.81	0.00	10.13	0.0	0.0	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu — Alternative 1 — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade	Alternative 2 — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade	Scrubber — Capital, $ MM: Blending facility	Capital, $ MM: Boiler modification	Capital, $ MM: ESP upgrade	Operation, $: Blending facility	Operation, $: Boiler modification	Operation, $: ESP upgrade
PICWAY 1	0.10	0	0.00	0	0.70	0.00	0.10	0	0.00	0	1.50	0.0	0.10	0	0.00	0	2.00	0.00
PICWAY 2	0.10	0	0.00	0	0.70	0.00	0.10	0	0.00	0	1.50	0.0	0.10	0	0.00	0	2.00	0.00
PICWAY 3	0.10	0	0.00	0	0.70	0.00	0.10	0	0.00	0	1.50	0.0	0.10	0	0.00	0	2.00	0.00
PICWAY PLANT	0.10	0	0.00	0	0.70	0.00	0.10	0	0.00	0	0.0	0.0	0.10	0	0.00	0	2.00	0.00
PIQUA 1	0.10	0	0.00	0	0.0	0.00	0.10	0	0.00	0	0.0	0.0	0.10	0	0.00	0	0	0.00
PIQUA 2	0.10	0	0.00	0	0.0	0.00	0.10	0	0.00	0	0.0	0.0	0.10	0	0.00	0	0	0.00
PIQUA 3	0.10	0	0.24	0	0.0	0.00	0.10	0	0.20	0	0.0	0.0	0.19	0	0.47	0	0	0.00
PIQUA 4	0.10	0	0.24	0	0.0	0.0	0.10	0	0.20	0	0.0	0.0	0.19	0	0.43	0	0	0.00
PIQUA 5	0.10	0	0.24	0	0.0	0.0	0.10	0	0.27	0	0.0	0.0	0.19	0	0.21	0	0	0.00
PIQUA PLANT	0.10	0	0.72	0	0.0	0.0	0.10	0	0.07	0	0.0	0.0	0.19	0	1.11	0	0	0.00

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western High Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Scrubs, $			Costs, $ MM			Scrubs, $			Costs, $ MM			Scrubs, $		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.10	0	0.33	0	1.21	0.00	0.10	0	0.36	0	2.65	0.0	0.19	0	0.00	0	2.77	0.0
[illegible] 2	0.10	0	0.00	0	1.21	0.00	0.19	0	0.54	0	2.65	0.0	0.16	0	1.06	0	2.77	0.0
[illegible] PLANT	0.10	0	0.61	0	1.21	0.00	0.19	0	0.92	0	2.65	0.0	0.10	0	1.95	0	2.77	0.0
[illegible] 1	0.10	0	3.14	0	0	0.00	0.30	0	2.30	0	0.0	0.0	0.31	0	7.99	0	0.0	0.3
[illegible] 2	0.20	0	3.14	0	0	0.00	0.30	0	2.30	0	0.0	0.0	0.31	0	7.99	0	0.0	0.3
[illegible] 3	0.30	0	5.66	0	0	0.0	0.33	0	5.17	0	0.0	0.0	0.35	0	13.33	0	0.0	0.3
[illegible] 4	0.30	0	3.97	0	0	0.0	0.31	0	4.14	0	0.0	0.0	0.33	0	10.14	0	0.0	0.3
[illegible] PLANT	0.54	0	15.68	0	0	0.0	0.36	0	16.83	0	0.0	0.0	0.86	0	41.66	0	0.0	0.3

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western High Btu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Scrubs, $			Costs, $ MM			Scrubs, $			Costs, $ MM			Scrubs, $		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
STUART 1	0.10	0	0.00	0	0	0.00	0.10	0	0.00	0	0	0.0	0.10	0	0.74	0	0	0.0
STUART 2	0.10	0	0.00	0	0	0.00	0.10	0	0.00	0	0	0.0	0.10	0	0.74	0	0	0.0
STUART 3	0.10	0	0.00	0	0	0.00	0.10	0	0.00	0	0	0.0	0.10	0	0.74	0	0	0.0
STUART 4	0.10	0	0.00	0	0	0.00	0.10	0	0.00	0	0	0.0	0.10	0	0.74	0	0	0.0
STUART PLANT	0.10	0	0.00	0	0	0.00	0.22	0	0.00	0	0	0.0	0.22	0	2.96	0	0	0.0
TAIT 3																		
TAIT 4																		
TAIT PLANT																		
TIDD 1	0.10	0	0.47	0	0	0.0	0.10	0	0.47	0	0	0.1	0.10	0	0.92	0	0	0.1
TIDD 2	0.10	0	0.47	0	0	0.0	0.10	0	0.47	0	0	0.1	0.10	0	0.92	0	0	0.1
TIDD 3	0.10	0	0.93	0	0	0.0	0.10	0	0.00	0	0	0.0	0.10	0	2.21	0	0	0.1
TIDD PLANT	0.10	0	1.47	0	0	0.0	0.10	0	2.03	0	0	0.0	0.10	0	4.00	0	0	0.1

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO TOWER PLANTS

Plant Identification	Coal blending																	
	Western high Stu																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Rerate, %			Costs, $ MM			Rerate, %			Costs, $ MM			Rerate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 12	0.10	0	1.47	0	0	0.0	0.10	0	2.27	0	0	0.0	0.10	0	2.66	0	0	0.1
[illegible] PLANT	0.10	0	1.47	0	0	0.0	0.10	0	2.27	0	0	0.0	0.10	0	2.66	0	0	0.1
[illegible] 1	0.00	0	0.00	0	0	0.0	0.00	0	0.00	0	0	0.0	0.00	0	0.40	0	0	0.1
[illegible] 2	0.00	0	0.00	0	0	0.0	0.00	0	0.00	0	0	0.0	0.00	0	0.18	0	0	0.1
[illegible] PLANT	0.00	0	0.00	0	0	0.0	0.00	0	0.00	0	0	0.0	0.00	0	1.83	0	0	0.1

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant identification	Coal blending																	
	Eastern coals																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
ACME 4	0.189	0.00	0.00	0.00	0.00	0.0	0.194	0.00	3.19	0.00	0.00	0.0						
ACME 16	0.183	0.00	0.89	0.00	0.00	0.0	0.184	0.00	0.00	0.00	0.00	0.0	0.187	0.00	2.72	0.00	0.00	0.2
ACME PLANT	0.192	0.00	0.89	0.00	0.00	0.0	0.198	0.00	4.00	0.00	0.00	0.0						
ANTIGUA 5	0.189	0.00	2.06	0.00	0.00	0.0	0.194	0.00	4.24	0.00	0.00	0.1						
ANTIGUA 6	0.189	0.00	1.11	0.00	0.00	0.0	0.00	0.00	1.63	0.00	0.00	0.0						
ANTIGUA PLANT	0.198	0.00	4.07	0.00	0.00	0.0	0.184	0.00	5.87	0.00	0.00	0.0						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant identification	Coal blending																	
	Eastern coals																	
	Alternative 1						Alternative 2						Regulation					
	Costs, $ MM			Derate, %			Costs, $ MM			Derate, %			Costs, $ MM			Derate, %		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
AVON LAKE 5	0.193	0.00	0.73	0.00	0.00	0.0	0.186	0.00	1.00	0.00	0.00	0.0	0.191	0.00	1.63	0.00	0.00	0.1
AVON LAKE 6	0.185	0.00	0.73	0.00	0.00	0.0	0.186	0.00	1.00	0.00	0.00	0.0	0.191	0.00	1.62	0.00	0.00	0.1
AVON LAKE 7	0.187	0.00	1.19	0.00	0.00	0.0	0.193	0.00	1.40	0.00	0.00	0.0						
AVON LAKE 8	0.200	0.00	4.38	0.00	0.00	0.0	0.210	0.00	4.70	0.00	0.00	0.0						
AVON LAKE PLANT	0.217	0.00	6.97	0.00	0.00	0.0	0.243	0.00	8.20	0.00	0.00	0.0						
BATSHORE 1	0.184	0.00	0.00	0.00	0.00	0.0	0.184	0.00	1.82	0.00	0.00	0.0						
BATSHORE 2	0.184	0.00	0.00	0.00	0.00	0.0	0.184	0.00	1.82	0.00	0.00	0.0						
BATSHORE 3	0.184	0.00	0.00	0.00	0.00	0.0	0.185	0.00	1.80	0.00	0.00	0.0						
BATSHORE 4	0.186	0.00	1.00	0.00	0.00	0.0	0.188	0.00	1.70	0.00	0.00	0.0						
BATSHORE PLANT	0.190	0.00	0.00	0.00	0.00	0.0	0.201	0.00	4.91	0.00	0.00	0.0						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Combs. 1 FGD			Scrubs. 1			Combs. 1 FGD			Scrubs. 1			Combs. 1 FGD			Scrubs. 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
BECKJORD 1	0.105	0.00	0.07	0.00	0.00	0.0	0.107	0.00	1.50	0.00	0.00	0.1						
BECKJORD 2	0.105	0.00	0.06	0.00	0.00	0.0	0.107	0.00	0.93	0.00	0.00	0.0						
BECKJORD 3	0.106	0.00	0.01	0.00	0.00	0.0	0.109	0.00	1.15	0.00	0.00	0.0						
BECKJORD 4	0.107	0.00	0.07	0.00	0.00	0.0	0.190	0.00	1.23	0.00	0.00	0.0						
BECKJORD 5	0.304	0.00	5.13	0.00	0.00	0.0	0.325	0.00	6.64	0.00	0.00	0.1						
BECKJORD PLANT	0.227	0.00	0.46	0.00	0.00	0.0	0.250	0.00	11.44	0.00	0.00	0.1						
GORBEN 6	0.196	0.00	5.33	0.00	0.00	0.0	0.216	0.00	5.00	0.00	0.00	0.1						
GORBEN PLANT	0.196	0.00	5.33	0.00	0.00	0.0	0.216	0.00	5.00	0.00	0.00	0.1						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Combs. 1 FGD			Scrubs. 1			Combs. 1 FGD			Scrubs. 1			Combs. 1 FGD			Scrubs. 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
CARDINAL 1	0.200	0.00	4.06	0.00	0.00	0.0	0.217	0.00	9.63	0.00	0.00	0.1						
CARDINAL 2	0.200	0.00	4.06	0.00	0.00	0.0	0.217	0.00	9.63	0.00	0.00	0.1						
CARDINAL PLANT	0.229	0.00	0.12	0.00	0.00	0.0	0.254	0.00	11.26	0.00	0.00	0.1						
CLEVELAND 2	0.17	0.00	0.45	0.00	0.00	0.0	0.19	0.00	0.50	0.00	0.00	0.0	0.20	0.00	0.50	0.00	0.00	0.0
CLEVELAND 3	0.17	0.00	0.45	0.00	0.00	0.0	0.19	0.00	0.50	0.00	0.00	0.0	0.20	0.00	0.50	0.00	0.00	0.0
CLEVELAND 4	0.17	0.00	0.45	0.00	0.00	0.0	0.19	0.00	0.50	0.00	0.00	0.0	0.20	0.00	0.50	0.00	0.00	0.0
CLEVELAND 5	0.17	0.00	0.45	0.00	0.00	0.0	0.19	0.00	0.50	0.00	0.00	0.0	0.20	0.00	0.50	0.00	0.00	0.0
CLEVELAND 6	0.10	0.00	0.06	0.00	0.00	0.0	0.11	0.00	0.00	0.00	0.00	0.0	0.10	0.00	3.91	0.00	0.00	0.1
CLEVELAND PLANT	0.22	0.00	2.66	0.00	0.00	0.0	0.18	0.00	2.99	0.00	0.00	0.0	0.20	0.00	4.23	0.00	0.00	0.1
GUERNSEY 1	0.187	0.00	0.00	0.00	0.00	0.0	0.190	0.00	0.00	0.00	0.00	0.0	0.191	0.00	0.01	0.00	0.00	0.0
GUERNSEY 2	0.186	0.00	0.00	0.00	0.00	0.0	0.187	0.00	0.00	0.00	0.00	0.0	0.122	0.00	0.41	0.00	0.00	0.0
GUERNSEY 3	0.196	0.00	0.00	0.00	0.00	0.0	0.206	0.00	0.00	0.00	0.00	0.0	0.220	0.00	0.67	0.00	0.00	0.0
GUERNSEY 4	0.20	0.00	0.00	0.00	0.00	0.0	0.23	0.00	0.97	0.00	0.00	0.0	0.20	0.00	1.10	0.00	0.00	0.0
CONESVILLE PLANT	0.211	0.00	0.00	0.00	0.00	0.0	0.223	0.00	0.97	0.00	0.00	0.0	0.247	0.00	0.13	0.00	0.00	0.0

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Eastern coals — Alternative 1 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade	Scrubber — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade
EAST LAKE 1	0.185	0.00	0.48	0.00	0.00	0.0	0.188	0.00	0.52	0.00	0.00	0.0	0.193	0.00	2.58	0.00	0.00	0.2
EAST LAKE 2	0.185	0.00	0.00	0.00	0.00	0.0	0.188	0.00	0.85	0.00	0.00	0.0	0.193	0.00	2.88	0.00	0.00	0.2
EAST LAKE 3	0.185	0.00	0.48	0.00	0.00	0.0	0.188	0.00	0.52	0.00	0.00	0.0	0.194	0.00	2.55	0.00	0.00	0.2
EAST LAKE 4	0.189	0.00	0.53	0.00	0.00	0.0	0.195	0.00	0.67	0.00	0.00	0.0						
EAST LAKE 5	0.201	0.00	4.54	0.00	0.00	0.0	0.219	0.00	4.81	0.00	0.00	0.0						
EAST LAKE PLANT	0.225	0.00	6.03	0.00	0.00	0.0	0.258	0.00	7.37	0.00	0.00	0.0						
ENGWATER 1	0.184	0.00	0.64	0.00	0.00	0.0	0.186	0.00	0.71	0.00	0.00	0.0						
ENGWATER 2	0.185	0.00	0.72	0.00	0.00	0.0	0.186	0.00	1.01	0.00	0.00	0.0	0.191	0.00	1.36	0.00	0.00	0.0
ENGWATER PLANT	0.189	0.00	1.36	0.00	0.00	0.0	0.192	0.00	1.72	0.00	0.00	0.0						
GAVIN 1	0.212	0.00	0.00	0.00	0.00	0.0	0.230	0.00	0.00	0.00	0.00	0.00	0.271	0.00	34.01	0.00	0.00	0.0
GAVIN PLANT	0.212	0.00	0.00	0.00	0.00	0.0	0.230	0.00	0.00	0.00	0.00	0.30	0.271	0.00	34.01	0.00	0.00	0.0
OORE 1	0.183	0.00	0.47	0.00	0.00	0.0	0.183	0.00	0.85	0.00	0.00	0.1	0.186	0.00	0.65	0.00	0.00	0.1
OORE 2	0.183	0.00	0.00	0.00	0.00	0.0	0.183	0.00	0.88	0.00	0.00	0.1	0.186	0.00	0.92	0.00	0.00	0.1
OORE PLANT	0.186	0.00	0.47	0.00	0.00	0.0	0.186	0.00	1.73	0.00	0.00	0.1	0.193	0.00	1.81	0.00	0.00	0.1

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Eastern coals — Alternative 1 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade	Scrubber — Costs, $ MM: Blending facility	Boiler modification	ESP upgrade	Derate, % Blending facility	Boiler modification	ESP upgrade
TYGER CREEK 1	0.187	0.00	0.00	0.00	0.00	0.0	0.190	0.00	0.97	0.00	0.00	0.0	0.197	0.00	1.10	0.00	0.00	0.0
TYGER CREEK 2	0.184	0.00	0.00	0.00	0.00	0.0	0.185	0.00	1.12	0.00	0.00	0.0	0.189	0.00	1.77	0.00	0.00	0.0
TYGER CREEK 3	0.187	0.00	0.00	0.00	0.00	0.0	0.190	0.00	3.00	0.00	0.00	0.0	0.197	0.00	3.26	0.00	0.00	0.0
TYGER CREEK PLANT	0.198	0.00	0.00	0.00	0.00	0.0	0.205	0.00	4.09	0.00	0.00	0.0	0.223	0.00	6.13	0.00	0.00	0.0
LAKESHORE 1	0.182	0.00	0.23	0.00	0.00	0.0	0.182	0.00	0.24	0.00	0.00	0.0	0.186	0.00	0.44	0.00	0.00	0.0
LAKESHORE 2	0.182	0.00	0.23	0.00	0.00	0.0	0.182	0.00	0.24	0.00	0.00	0.0	0.186	0.00	0.44	0.00	0.00	0.0
LAKESHORE 3	0.183	0.00	0.26	0.00	0.00	0.0	0.186	0.00	0.29	0.00	0.00	0.0	0.187	0.00	0.52	0.00	0.00	0.0
LAKESHORE 4	0.183	0.00	0.26	0.00	0.00	0.0	0.183	0.00	0.29	0.00	0.00	0.0	0.187	0.00	0.52	0.00	0.00	0.0
LAKESHORE 5	0.187	0.00	1.00	0.00	0.00	0.0	0.193	0.00	1.17	0.00	0.00	0.0						
LAKESHORE PLANT	0.197	0.00	1.90	0.00	0.00	0.0	0.220	0.00	2.23	0.00	0.00	0.0						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO PLANTS

Plant Identification	Coal blending / Eastern coals: Alternative 1 — Costs, $ MM: Blending facility	Alternative 1 — Costs, $ MM: Boiler modification	Alternative 1 — Costs, $ MM: ESP upgrade	Alternative 1 — Derate, %: Blending facility	Alternative 1 — Derate, %: Boiler modification	Alternative 1 — Derate, %: ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Alternative 2 — Costs, $ MM: Boiler modification	Alternative 2 — Costs, $ MM: ESP upgrade	Alternative 2 — Derate, %: Blending facility	Alternative 2 — Derate, %: Boiler modification	Alternative 2 — Derate, %: ESP upgrade	Regulation — Costs, $ MM: Blending facility	Regulation — Costs, $ MM: Boiler modification	Regulation — Costs, $ MM: ESP upgrade	Regulation — Derate, %: Blending facility	Regulation — Derate, %: Boiler modification	Regulation — Derate, %: ESP upgrade
MIAMI FORT 3	0.186	0.00	1.06	0.00	0.00	0.0	0.193	0.00	2.16	0.00	0.00	0.0						
MIAMI FORT 4	0.201	0.00	0.99	0.00	0.00	0.0	0.210	0.00	1.94	0.00	0.00	0.0						
MIAMI FORT 5	0.24	0.00	4.06	0.00	0.00	0.0	0.24	0.00	8.62	0.00	0.00	0.1						
MIAMI FORT PLANT	0.44	0.00	0.10	0.00	0.00	0.0	0.202	0.00	0.00	0.00	0.00	0.0						
MIDDLETOWN RIVER 1A	0.101	0.00	0.00	0.00	0.00	0.0	0.210	0.00	0.00	0.00	0.00	0.0	0.239	0.00	12.39	0.00	0.00	0.1
MIDDLETOWN RIVER 2	0.196	0.00	0.00	0.00	0.00	0.0	0.210	0.00	2.73	0.00	0.00	0.0	0.236	0.00	4.76	0.00	0.00	0.1
MIDDLETOWN RIVER PLT.	0.00	0.00	0.00	0.00	0.00	0.0	0.240	0.00	12.37	0.00	0.00	0.0	0.265	0.00	17.16	0.00	0.00	0.1

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending / Eastern coals: Alternative 1 — Costs, $ MM: Blending facility	Alternative 1 — Costs, $ MM: Boiler modification	Alternative 1 — Costs, $ MM: ESP upgrade	Alternative 1 — Derate, %: Blending facility	Alternative 1 — Derate, %: Boiler modification	Alternative 1 — Derate, %: ESP upgrade	Alternative 2 — Costs, $ MM: Blending facility	Alternative 2 — Costs, $ MM: Boiler modification	Alternative 2 — Costs, $ MM: ESP upgrade	Alternative 2 — Derate, %: Blending facility	Alternative 2 — Derate, %: Boiler modification	Alternative 2 — Derate, %: ESP upgrade	Regulation — Costs, $ MM: Blending facility	Regulation — Costs, $ MM: Boiler modification	Regulation — Costs, $ MM: ESP upgrade	Regulation — Derate, %: Blending facility	Regulation — Derate, %: Boiler modification	Regulation — Derate, %: ESP upgrade
KYGER 1	0.105	0.00	0.07	0.00	0.00	0.0	0.190	0.00	1.06	0.00	0.00	0.0	0.207	0.00	3.31	0.00	0.00	0.20
KYGER 2	0.205	0.00	0.07	0.00	0.00	0.0	0.190	0.00	1.06	0.00	0.00	0.0	0.192	0.00	3.31	0.00	0.00	0.20
KYGER PLANT	0.199	0.00	1.34	0.00	0.00	0.0	0.200	0.00	2.12	0.00	0.00	0.0	0.41	0.00	6.62	0.00	0.00	0.20
NORWALK 4	0.17	0.00	0.24	0.00	0.00	0.0	0.175	0.00	0.25	0.00	0.00	0.0	0.18	0.00	0.25	0.00	0.00	0.0
NORWALK 5	0.17	0.00	0.21	0.00	0.00	0.0	0.175	0.00	0.23	0.00	0.00	0.0	0.18	0.00	0.24	0.00	0.00	0.0
NORWALK PLANT	0.17	0.00	0.45	0.00	0.00	0.0	0.175	0.00	0.48	0.00	0.00	0.0	0.18	0.00	0.49	9.50	0.00	0.0
ORRVILLE 1	0.16	0.00	0.33	0.00	0.00	0.2	0.16	0.00	0.46	0.00	0.00	0.2	0.16	0.00	0.99	0.00	0.00	0.2
ORRVILLE 2	0.16	0.00	0.04	0.00	0.00	0.2	0.17	0.00	2.02	0.00	0.00	0.2	0.19	0.00	2.02	0.00	0.00	0.2
ORRVILLE PLANT	0.16	0.00	1.27	0.00	0.00	0.2	0.17	0.00	3.01	0.00	0.00	0.2	0.16	0.00	3.01	0.00	0.00	0.2

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Combo. 1 HC			Scrubber 1			Combo. 1 HC			Scrubber 1			Combo. 1 HC			Scrubber 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
ZANESVILLE 1	0.10	0.00	1.40	0.00	0.00	0.1	0.00	0.00	2.70	0.00	0.00	0.1	0.01	0.00	4.00	0.00	0.00	0.0
ZANESVILLE PLANT	0.10	0.00	1.40	0.00	0.00	0.1	0.00	0.00	2.70	0.00	0.00	0.1	0.01	0.00	4.00	0.00	0.00	0.0
PICRO 4	0.103	0.00	0.00	0.00	0.00	0.0	0.101	0.00	0.01	0.00	0.00	0.0						
PICRO 5	0.103	0.00	0.00	0.00	0.00	0.0	0.101	0.00	0.01	0.00	0.00	0.0						
PICRO 6	0.103	0.00	0.00	0.00	0.00	0.0	0.104	0.00	0.00	0.00	0.00	0.0						
PICRO PLANT	0.107	0.00	0.00	0.00	0.00	0.0	0.106	0.00	2.53	0.00	0.00	0.0						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Combo. 1 HC			Scrubber 1			Combo. 1 HC			Scrubber 1			Combo. 1 HC			Scrubber 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
PICRO 1	0.103	0.00	0.00	0.00	0.00	0.00	0.101	0.00	0.50	0.00	0.00	0.00	0.103	0.00	0.00	0.00	0.00	0.00
PICRO 2	0.103	0.00	0.00	0.00	0.00	0.00	0.101	0.00	0.50	0.00	0.00	0.00	0.103	0.00	0.00	0.00	0.00	0.00
PICRO 3	0.103	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.05	0.00	0.00	0.00	0.103	0.00	1.14	0.00	0.00	0.00
PICRO PLANT	0.107	0.00	0.00	0.00	0.00	0.00	0.102	0.00	1.05	0.00	0.00	0.00	0.100	0.00	0.00	0.00	0.00	0.00
PIQUA 1	0.103	0.00	0.00	0.00	0.00	0.00	0.101	0.00	0.00	0.00	0.00	0.00	0.103	0.00	0.00	0.00	0.00	0.00
PIQUA 2	0.103	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.00	0.00	0.00	0.00	0.103	0.00	0.00	0.00	0.00	0.00
PIQUA 3	0.103	0.00	0.33	0.00	0.00	0.00	0.101	0.00	0.38	0.00	0.00	0.00	0.103	0.00	0.44	0.00	0.00	0.00
PIQUA 4	0.103	0.00	0.33	0.00	0.00	0.00	0.101	0.00	0.38	0.00	0.00	0.00	0.103	0.00	0.44	0.00	0.00	0.00
PIQUA 5	0.103	0.00	0.24	0.00	0.00	0.00	0.101	0.00	0.27	0.00	0.00	0.00	0.103	0.00	0.31	0.00	0.00	0.00
PIQUA PLANT	0.109	0.00	0.70	0.00	0.00	0.00	0.104	0.00	0.87	0.00	0.00	0.00	0.103	0.00	1.10	0.00	0.00	0.00

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED MAIN POWER PLANTS

Plant Identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Scrubber module						Scrubber module						Scrubber module					
	Scrubber 1			Boiler 1			Scrubber 1			Boiler 1			Scrubber 1			Boiler 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
[illegible] 1	0.101	0.00	0.27	0.00	0.00	0.0	0.101	0.00	0.33	0.00	0.00	0.0	0.100	0.00	0.70	0.00	0.00	0.0
[illegible] 2	0.104	0.00	0.00	0.00	0.00	0.0	0.100	0.00	0.12	0.00	0.00	0.0	0.100	0.00	1.00	0.00	0.00	0.0
[illegible] PLANT	0.107	0.00	0.27	0.00	0.00	0.0	0.100	0.00	0.10	0.00	0.00	0.0	0.100	0.00	1.70	0.00	0.00	0.0
[illegible] 1	0.101	0.00	3.00	0.00	0.00	0.0	0.003	0.00	3.10	0.00	0.00	0.0						
[illegible] 2	0.101	0.00	3.00	0.00	0.00	0.0	0.003	0.00	3.10	0.00	0.00	0.0						
[illegible] 3	0.210	0.00	0.31	0.00	0.00	0.0	0.200	0.00	0.44	0.00	0.00	0.0						
[illegible] 4	0.300	0.00	3.00	0.00	0.00	0.0	0.200	0.00	4.00	0.00	0.00	0.0						
[illegible] PLANT	0.804	0.00	10.22	0.00	0.00	0.0	0.506	0.00	10.00	0.00	0.00	0.0						

Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal blending																	
	Alternative 1						Alternative 2						Alternative 3					
	Scrubber module						Scrubber module						Scrubber module					
	Scrubber 1			Boiler 1			Scrubber 1			Boiler 1			Scrubber 1			Boiler 1		
	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade	Blending facility	Boiler modification	ESP upgrade
STEAM 1	0.101	0.00	0.00	0.00	0.00	0.00	0.106	0.00	0.00	0.00	0.00	0.00	0.101	0.00	0.70	0.00	0.00	0.0
STEAM 2	0.101	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.00	0.00	0.00	0.00	0.101	0.00	0.70	0.00	0.00	0.0
STEAM 3	0.104	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.70	0.00	0.00	0.0
STEAM 4	0.104	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.00	0.00	0.00	0.00	0.100	0.00	0.70	0.00	0.00	0.0
STEAM PLANT	0.100	0.00	0.00	0.00	0.00	0.00	0.304	0.00	0.00	0.00	0.00	0.00	0.310	0.00	2.12	0.00	0.00	0.0
TEST 3																		
TEST 4																		
TEST PLANT																		
TEST 1	0.10	0.00	0.27	0.00	0.00	0.00	0.10	0.00	0.33	0.00	0.00	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TEST 2	0.10	0.00	0.27	0.00	0.00	0.00	0.10	0.00	0.33	0.00	0.00	0.1	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TEST 3	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.0	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
TEST PLANT	0.10	0.00	0.54	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.0	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*

* Emissions rate will not meet 0.54 regulation.

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Table 4-1: Section 4. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GEAR PIPER PLANTS

Plant identification	Coal blending																	
	[illegible]						[illegible]						[illegible]					
	[illegible]			[illegible]			[illegible]			[illegible]			[illegible]			[illegible]		
	Standing facility	Boiler modification	ESP upgrade	Standing facility	Boiler modification	ESP upgrade	Standing facility	Boiler modification	ESP upgrade	Standing facility	Boiler modification	ESP upgrade	Standing facility	Boiler modification	ESP upgrade	Standing facility	Boiler modification	ESP upgrade
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] PLANT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] 1														[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] 2														[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] PLANT														[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
ACME 4	3.3	26 TPH coal cleaning not feasible		2.3	1.2	0.3
ACME 16	3.3			2.3	3.1	0.3
ACME PLANT	3.3	1.8	0.1	2.3	4.3	0.3
ASHTABULA 5	3.1	1.4	0.1	2.4	3.3	0.2
ASHTABULA 4	3.1	2.3	0.1	2.4	5.2	0.2
ASHTABULA PLANT	3.1	3.7	0.1	2.4	8.5	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
AVON LAKE 5	3.7	Plant has more than 3 stacks		2.6		
AVON LAKE 6	3.7			2.6		
AVON LAKE 7	3.7			2.6		
AVON LAKE 8	3.7			2.6		
AVON LAKE PLANT	3.7	8.5	0.1	2.6	19.6	0.2
BAYSHORE 1	2.6	Plant has more than 3 stacks		2.0		
BAYSHORE 2	2.6			2.0		
BAYSHORE 3	2.6			2.0		
BAYSHORE 4	2.6			2.0		
BAYSHORE PLANT	2.6	3.1	0.1	2.0	7.3	0.1

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
BECKJORD 1	3.4	Plant has more than 3 stacks		2.6		
BECKJORD 2	3.4			2.6		
BECKJORD 3	3.4			2.6		
BECKJORD 4	3.4			2.6		
BECKJORD 5	3.4			2.6		
BECKJORD PLANT	3.4	5.3	0.1	2.6	12.3	0.2
BURGER 6	3.7	5.0	0.1	2.6	11.5	0.2
BURGER PLANT	3.7	5.0	0.1	2.6	11.5	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
CARDINAL 1	2.4	3.85	0.1	3.3	8.95	0.1
CARDINAL 2	2.4	3.85	0.1	3.3	8.95	0.1
CARDINAL PLANT	2.4	7.7	0.1	3.3	17.9	0.1
CLEVELAND 2		Plant has more than 3 stacks				
CLEVELAND 3		Plant has more than 3 stacks				
CLEVELAND 4		Plant has more than 3 stacks				
CLEVELAND 5		Plant has more than 3 stacks				
CLEVELAND 6		Plant has more than 3 stacks				
CLEVELAND PLANT	2.4	1.9	0.1	1.4	4.4	0.2
CONESVILLE 1	6.2	2.0	0.1	4.1	4.6	0.2
CONESVILLE 2	6.2	1.0	0.1	4.1	2.4	0.2
CONESVILLE 3	6.2	6.5	0.1	4.1	14.9	0.2
CONESVILLE 4	6.2	3.3	0.1	4.1	9.0	0.2
CONESVILLE PLANT	6.2	9.5	0.1	4.1	21.9	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
EAST LAKE 1	3.2	Plant has more than 3 stacks		2.4		
EAST LAKE 2	3.2			2.4		
EAST LAKE 3	3.2			2.4		
EAST LAKE 4	3.2			2.4		
EAST LAKE 5	3.2			2.4		
EAST LAKE PLANT	3.2	8.4	0.1	2.4	19.5	0.2
EDGEWATER 1	3.3	27 TPH coal cleaning not feasible		2.3	1.2	0.1
EDGEWATER 2	3.3			2.3	1.3	0.1
EDGEWATER PLANT	3.3	1.1	0.1	2.3	2.5	0.1
GAVIN 1	3.4	5.2	0.1	2.5	12.0	0.1
GAVIN PLANT	3.4	5.2	0.1	2.5	12.0	0.1
GORGE 1	4.0	0.5	0.2	2.8	1.3	0.3
GORGE 2	4.0	0.5	0.2	2.8	1.2	0.3
GORGE PLANT	4.0	1.0	0.2	2.8	2.5	0.3

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
KYGER CREEK 1	5.0	4.2	0.1	3.1	9.8	0.2
KYGER CREEK 2	5.0	2.1	0.1	3.1	5.0	0.2
KYGER CREEK 3	5.0	4.4	0.1	3.1	10.2	0.2
KYGER CREEK PLANT	5.0	10.7	0.1	3.1	25.0	0.2
LAKESHORE 1	2.7	Plant has more than 3 stacks		2.0		
LAKESHORE 2	2.7			2.0		
LAKESHORE 3	2.7			2.0		
LAKESHORE 4	2.7			2.0		
LAKESHORE 5	2.7			2.0		
LAKESHORE PLANT	2.7	3.1	0.1	2.0	7.1	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
MIAMI FORT 3	3.9	1.6	0.1	3.1	3.7	0.2
MIAMI FORT 4	3.9	1.4	0.1	3.1	3.3	0.2
MIAMI FORT 5	3.9	3.1	0.1	3.1	7.2	0.2
MIAMI FORT PLANT	3.9	6.1	0.1	3.1	14.2	0.2
MUSKINGUM RIV. 1A	6.2	7.6	0.1	3.8	17.6	0.2
MUSKINGUM RIV. 2	6.2	5.1	0.1	3.8	11.7	0.2
MUSKINGUM RIV. PLT.	6.2	12.7	0.1	3.8	29.3	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
MILES 1	3.7	1.3	0.1	2.5	2.5	0.2
MILES 2	3.7	1.4	0.1	2.5	2.5	0.2
MILES PLANT	3.7	2.7	0.1	2.5	5.0	0.2
NORWALK 4	4.0	0.0	0.0	2.8	0.0	0.0
NORWALK 5	4.0	0.0	0.0	2.8	0.0	0.0
NORWALK PLANT	4.0	Plant too small for coal cleaning		2.8 (7 1.6 sp.gr and 13 1.3sp.gr TPH)		
ORRVILLE 1		50 TPH coal cleaning not feasible				
ORRVILLE 2		50 TPH coal cleaning not feasible				
ORRVILLE PLANT	6.0	0.7	0.1	4.8	1.8	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
PAINESVILLE 1		50 TPH coal cleaning not feasible				
PAINESVILLE PLANT		50 TPH coal cleaning not feasible				
PHILO 4	4.0	0.0	0.0	2.8	2.6	0.1
PHILO 5	4.0	0.0	0.0	2.8	2.6	0.1
PHILO 6	4.0	41 TPH coal cleaning not feasible		2.8	2.0	0.1
PHILO PLANT	4.0	3.0	0.1	2.8	7.2	0.1

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
PICWAY 1	6.4	11 TPH coal cleaning not feasible		4.4	20 TPH coal cleaning not feasible	
PICWAY 2	6.4	0.0	0.0	4.4	0.0	0.0
PICWAY 3	6.4	0.0	0.0	4.4	0.0	0.0
PICWAY PLANT	6.4	1.4	0.2	4.4	3.3	0.4
PIQUA 1	2.7	Plant has more than 3 stacks		2.0	0.0	0.0
PIQUA 2	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 3	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 4	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 5	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA PLANT	2.7	Plant too small for coal cleaning 30 1.6 sp.gr. and 50 1.3 sp.gr TPH)				

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
POSTON 1	3.4	39 TPH coal cleaning not feasible		2.5	1.8	0.2
POSTON 2	3.4	0.0	0.0	2.5	2.6	0.2
POSTON PLANT	3.4	1.9	0.1	2.5	4.4	0.2
SAMMIS 1	3.1	Plant has more than 3 stacks		2.2	0.0	0.0
SAMMIS 2	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS 3	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS 4	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS PLANT	3.1	15.3	0.1	2.2	35.5	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
STUART 1	2.5	Plant has more than 3 stacks		2.0	0.0	0.0
STUART 2	2.5	0.0	0.0	2.0	0.0	0.0
STUART 3	2.5	0.0	0.0	2.0	0.0	0.0
STUART 4	2.5	0.0	0.0	2.0	0.0	0.0
STUART PLANT	2.5	9.1	0.1	[illegible].0	21.1	0.2
TAIT 3	[illegible].0	0.0	0.0	0.0	0.0	0.0
TAIT 4	0.0	0.0	0.0	0.0	0.0	0.0
TAIT PLANT	SO_2 emissions are presently 1.75 lb/MM BTU; proposed regulation is 1.6 lb/MM BTU.					
TIDD 1	4.0	50 TPH coal cleaning not feasible		3.1	0.65	
TIDD 2	4.0	0.5		3.1	0.65	
TIDD 3	4.0	1.1	0.1	3.1	1.5	0.2
TIDD PLANT	4.0	2.1	0.1	3.1	2.8	0.2

Table 4-1: Section 5. CAPITAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %	Emission level using cleaned coal, lb/MM Btu	Cost, $/MM	Capacity penalty, %
TORONTO 12	3.2	1.7	0.2	2.5	3.9	0.4
TORONTO PLANT	3.2	1.7	0.2	2.5	3.9	0.4
WOODCOCK 1	0.0	0.0	0.0	00	0.0	0.0
WOODCOCK 2	0.0	0.0	0.0	0.0	0.0	0.0
WOODCOCK PLANT	SO_2 emissions are presently 1.79 lb/MM BTU; proposed regulation is 1.6 lb/MM BTU.					

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
ACME 4	No	Yes
ACME 16	No	No
ACME PLANT	No	
ASHTABULA 5	No	No
ASHTABULA 4	No	No
ASHTABULA PLANT	No	No

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
AVON LAKE 5	No	No
AVON LAKE 6	No	No
AVON LAKE 7	No	No
AVON LAKE 8	No	No
AVON LAKE PLANT	No	No
BAYSHORE 1	No	No
BAYSHORE 2	No	No
BAYSHORE 3	No	No
BAYSHORE 4	No	No
BAYSHORE PLANT	No	No

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
BECKJORD 1	No	No
BECKJORD 2	No	No
BECKJORD 3	No	No
BECKJORD 4	No	No
BECKJORD 5	No	No
BECKJORD PLANT	No	No
BURGER 6	No	No
BURGER PLANT	No	No

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate Reason	
	Remaining life	Capacity factor
CARDINAL 1	No	No*
CARDINAL 2	No	No*
CARDINAL PLANT	No	No*
CLEVELAND 2	No	No*
CLEVELAND 3	No	No*
CLEVELAND 4	No	No*
CLEVELAND 5	No	No*
CLEVELAND 6	No	No*
CLEVELAND PLANT	No	No*
CONESVILLE 1	No	No
CONESVILLE 2	No	No
CONESVILLE 3	No	No
CONESVILLE 4	No	No
CONESVILLE PLANT	No	No

* Approximate capacity factor.

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
EAST LAKE 1	No	No
EAST LAKE 2	No	No
EAST LAKE 3	No	No
EAST LAKE 4	No	No
EAST LAKE 5	No	No
EAST LAKE PLANT	No	No
EDGEWATER 1	No	No
EDGEWATER 2	No	No
EDGEWATER PLANT	No	No
GAVIN 1	No	No*
GAVIN PALNT	No	No*
GORGE 1	No	No
GORGE 2	No	No
GORGE PLANT	No	No

* Approximate capacity factor.

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate Reason	
	Remaining life	Capacity factor
KYGER CREEK 1	No	No
KYGER CREEK 2	No	No
KYGER CREEK 3	No	No
KYGER CREEK PLANT	No	No
LAKESHORE 1	No	No
LAKESHORE 2	No	No
LAKESHORE 3	No	No
LAKESHORE 4	No	No
LAKESHORE 5	No	No
LAKESHORE PLANT	No	No

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
MIAMI FORT 3	No	No
MIAMI FORT 4	No	No
MIAMI FORT 5	No	No
MIAMI FORT PLANT	No	No
MUSKINGUM RIV. 1A	No	No*
MUSKINGUM RIV. 2	No	No*
MUSKINGUM RIV. PLT.	No	No*

* Approximate capacity factor.

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
NILES 1	No	No
NILES 2	No	No
NILES PLANT	No	No
NORWALK 4	No	Yes
NORWALK 5	No	Yes
NORWALK PLANT	No	Yes
ORRVILLE 1	No	Yes
ORRVILLE 2	No	No
ORRVILLE PLANT	No	Yes

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate Reason	
	Remaining life	Capacity factor
PAINESVILLE 1	No	Yes*
PAINESVILLE PLANT	No	Yes*
PHILO 4	No	No*
PHILO 5	No	No*
PHILO 6	No	No*
PHILO PLANT	No	No*

* Approximate capacity factor.

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
PICWAY 1	No	No
PICWAY 2	No	No
PICWAY 3	No	No
PICWAY PLANT	No	No
PIQUA 1	Yes	Yes
PIQUA 2	Yes	Yes
PICUA 3	No	No
PIQUA 4	No	No
PIQUA 5	No	No
PIQUA PLANT		

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
POSTON 1	No	No
POSTON 2	No	No
POSTON PLANT	No	No
SAMMIS 1	No	No
SAMMIS 2	No	No
SAMMIS 3	No	No
SAMMIS 4	No	No
SAMMIS PLANT		

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
STUART 1	No	No
STUART 2	No	No
STUART 3	No	No
STUART 4	No	No
STUART PLANT	No	No
TAIT 3	No	No
TAIT 4	No	No
TAIT PLANT	No	No
TIDD 1	No	No
TIDD 2	No	No
TIDD 3	No	No
TIDD PLANT	No	No

Table 4-1; Section 6. PHASEOUT CANDIDATES FOR SELECTED OHIO POWER PLANTS

Plant identification	Phaseout candidate	
	Reason	
	Remaining life	Capacity factor
TORONTO 12	No	No
TORONTO PLANT	No	No
WOODCOCK 1	Yes	No*
WOODCOCK 2	No	No*
WOODCOCK PLANT		No*

* Approximate capacity factor.

Table 4.2; Section 1. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

(This section is identical to Table 4.1; Section 1. This section is included to maintain the proper numbering sequences for the annualized cos. tables.)

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
ACME 4	1.50	0.34	2.49	0.69	0.394	1.04	0.667	1.19	0.936	2.39	1.256	0.358
ACME 16	0.934	0.35	1.37	0.72	1.80	1.09	0.421	1.36	0.461	2.75	0.493	4.13
ACME PLANT	1.95	0.35	3.35	0.70	4.79	1.05	0.753	1.22	1.06	2.45	1.41	3.68
ASHTABULA 5	3.24	1.44	6.05	2.94	8.82	4.37	0.725	3.30	1.14	6.68	1.49	9.96
ASHTABULA 4	3.49	0.41	6.45	0.84	9.38	1.26	0.325	1.05	0.233	3.72	0.197	5.56
ASHTABULA PLANT	6.28	0.84	12.06	1.72	17.78	2.56	0.682	2.46	0.977	4.96	1.413	7.40

Table 4-2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
AVON LAKE 5	1.62	0.15	2.74	0.29	3.86	0.44	0.392	0.72	0.389	1.44	0.378	2.17
AVON LAKE 6	1.48	0.15	2.45	0.29	3.43	0.44	0.417	0.72	0.440	1.44	0.456	2.17
AVON LAKE 7	2.83	0.42	5.12	0.85	7.41	1.27	0.416	1.98	0.424	3.97	0.484	5.96
AVON LAKE 8	8.53	0.38	16.55	0.78	24.59	1.16	0.881	1.87	- 0.136	3.76	- 0.459	5.63
AVON LAKE PLANT	12.64	0.30	24.58	0.60	36.70	0.90	0.336	1.44	0.313	2.88	0.237	4.33
BAYSHORE 1	1.37	0.29	2.23	0.60	3.08	0.90	0.409	1.04	0.429	2.10	0.442	3.15
BAYSHORE 2	1.41	0.29	2.32	0.60	3.21	0.90	0.402	1.04	0.415	2.10	0.420	3.15
BAYSHORE 3	1.39	0.29	2.26	0.60	3.13	0.90	0.408	1.04	0.426	2.10	0.436	3.15
BAYSHORE 4	2.11	0.31	3.67	0.63	5.52	0.94	0.394	1.13	0.390	2.24	0.368	3.37
BAYSHORE PLANT	4.89	0.30	9.03	0.61	13.17	0.92	0.592	1.08	0.603	2.15	0.580	3.23

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
BECKJORD 1	1.27	0.47	2.04	0.96	2.81	1.43	0.437	2.02	0.494	4.08	0.547	6.11
BECKJORD 2	1.32	0.50	2.15	1.01	2.97	1.51	0.436	2.10	0.492	4.21	0.543	6.32
BECKJORD 3	1.54	0.49	2.59	1.01	3.62	1.51	0.445	2.04	0.513	4.12	0.567	6.17
BECKJORD 4	1.98	0.43	3.46	0.89	4.93	1.32	0.406	1.83	0.430	3.68	0.439	5.52
BECKJORD 5	5.36	0.46	10.27	0.93	15.10	1.39	0.845	1.89	1.254	3.80	1.711	5.69
BECKJORD PLANT	9.59	0.47	18.73	0.94	27.77	1.41	1.130	1.93	1.852	3.88	2.563	5.81
BURGER 4	7.81	0.53	15.12	1.06	22.41	1.59	0.391	2.53	0.343	5.06	0.340	7.60
BURGER PLANT	7.81	0.53	15.12	1.06	22.41	1.59	0.391	2.53	0.343	5.06	0.340	7.60

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
CARDINAL 1	6.11	0.42	11.69	0.85	17.24	1.26	0.46	2.11	0.63	4.22	0.69	6.32
CARDINAL 2	6.76	0.42	13.00	0.85	19.20	1.26	0.34	2.11	0.38	4.22	0.32	6.32
CARDINAL PLANT	12.36	0.42	24.15	0.85	36.03	1.27	0.43	2.15	0.74	4.22	0.86	6.32
CLEVELAND 2	0.68	0.27	0.83	0.54	1.00	0.82	0.43	1.66	0.44	3.38	0.45	5.00
CLEVELAND 3	0.68	0.27	0.83	0.54	1.00	0.82	0.43	1.66	0.44	3.38	0.45	5.00
CLEVELAND 4	0.68	0.27	0.83	0.54	1.00	0.82	0.43	1.66	0.44	3.38	0.45	5.00
CLEVELAND 5	0.68	0.27	0.83	0.54	1.00	0.82	0.43	1.66	0.44	3.38	0.45	5.00
CLEVELAND 6	1.18	0.25	1.82	0.48	2.44	0.69	0.43	1.66	0.42	3.32	0.39	5.00
CLEVELAND PLANT	2.73	0.27	3.86	0.52	5.15	0.75	0.80	1.70	0.70	3.35	0.80	5.00
CONESVILLE 1	2.57	0.31	4.03	0.62	5.47	0.93	0.36	1.55	0.39	2.72	0.41	3.87
CONESVILLE 2	3.44	0.33	5.54	0.65	7.59	0.97	0.13	3.99	-0.26	6.83	-0.19	9.66
CONESVILLE 3	12.14	0.31	20.25	0.62	28.35	0.93	-0.41	2.51	-0.67	4.34	-1.02	6.15
CONESVILLE 4	18.21*	0.27*	30.52*	0.51*	45.32*	0.72*	-0.80*	2.15*	-1.11*	3.59*	-1.63*	5.88*
CONESVILLE PLANT	17.16	0.31	28.71	0.63	40.25	0.93	-0.66	2.47	-1.07	3.64	-1.45	6.04

* Gross estimate of costs.

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
EAST LAKE 1	1.80	0.39	3.11	0.79	4.40	1.19	0.35	1.79	0.31	3.61	0.28	5.40
EAST LAKE 2	1.74	0.39	2.94	0.79	4.21	1.19	0.36	1.79	0.34	3.61	0.31	5.40
EAST LAKE 3	1.82	0.39	3.15	0.79	4.45	1.19	0.35	1.79	0.31	3.61	0.27	5.40
EAST LAKE 4	2.38	0.40	4.25	0.80	6.09	1.19	0.41	1.95	0.42	3.90	0.42	5.84
EAST LAKE 5	6.31	0.37	12.02	0.74	17.76	1.10	0.42	1.64	0.54	3.27	0.59	4.91
EAST LAKE PLANT	12.17	0.38	23.71	0.77	35.09	1.14	0.46	1.74	0.56	3.48	0.54	5.21
EDGEWATER 1	1.12	0.22	1.74	0.44	2.35	0.64	0.45	0.96	0.51	1.92	0.57	2.88
EDGEWATER 2	1.55	0.36	2.59	0.72	3.62	1.08	0.38	1.69	0.36	3.39	0.34	5.08
EDGEWATER PLANT	2.13	0.27	3.67	0.55	5.20	0.82	0.52	1.23	0.59	2.48	0.63	3.70
GAVIN 1	18.74	0.22	36.85	0.45	55.33	0.67	-0.21	1.20	-0.71	2.40	-1.04	3.59
GAVIN PLANT	18.82	0.22	36.85	0.45	55.32	0.67	-0.21	1.20	-0.71	2.40	-1.04	3.59
GORGE 1	1.33	0.51	2.17	1.04	3.00	1.58	0.36	2.92	0.32	5.88	0.28	8.85
GORGE 2	1.31	0.53	2.12	1.09	2.92	1.64	0.36	2.94	0.34	5.91	0.31	8.90
GORGE PLANT	2.19	0.53	3.84	1.08	5.47	1.61	0.38	2.94	0.31	5.92	0.23	8.87

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
KYGER CREEK 1	3.89	0.17	7.31	0.34	10.65	0.50	0.17	1.10	-0.09	2.22	-0.37	3.33
KYGER CREEK 2	2.21	0.17	3.94	0.34	5.63	0.50	0.28	1.09	0.16	2.21	0.03	3.31
KYGER CREEK 3	4.08	0.17	7.69	0.34	11.23	0.50	0.13	1.10	-0.17	2.22	-0.48	3.33
KYGER CREEK PLANT	9.22	0.17	17.92	0.34	26.47	0.50	-0.13	1.10	-0.87	2.22	-1.63	3.33
LAKESHORE 1	0.59	0.27	0.81	0.54	1.03	0.82	0.40	0.65	0.44	1.80	0.47	2.96
LAKESHORE 2	0.59	0.27	0.83	0.54	1.07	0.82	0.40	0.65	0.44	1.80	0.46	2.96
LAKESHORE 3	0.70	0.31	1.12	0.64	1.54	0.96	0.41	0.80	0.44	2.19	0.46	3.59
LAKESHORE 4	0.72	0.31	1.16	0.64	1.61	0.96	0.41	0.80	0.43	2.19	0.44	3.59
LAKESHORE 5	1.72	0.35	3.63	0.71	5.54	1.06	0.49	0.95	0.50	2.31	0.53	3.68
LAKESHORE PLANT	2.50	0.33	5.69	0.66	8.87	0.98	0.82	0.84	0.92	2.17	1.18	3.49

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
MIAMI FORT 3	2.82	0.30	5.11	0.61	7.40	0.91	0.45	1.60	0.48	3.20	0.57	4.81
MIAMI FORT 4	3.33	0.50	6.12	1.01	8.90	1.51	0.27	2.35	0.12	4.72	-0.04	7.08
MIAMI FORT 5	6.06	0.42	11.64	0.85	17.19	1.26	0.41	2.11	0.58	4.22	0.64	6.32
MIAMI FORT PLANT	10.92	0.41	20.72	0.80	30.51	1.17	0.79	1.97	0.86	3.91	0.43	5.73
MUSKINGUM RIVER 1A	19.25	0.41	37.85	0.83	56.57	1.24	-0.52	3.06	-1.48	6.14	-2.33	9.21
MUSKINGUM RIVER 2	12.11	0.40	23.74	0.81	35.30	1.22	-0.39	3.47	-1.12	6.97	-1.95	10.46
MUSKINGUM RIVER PLT.	31.03	0.41	61.49	0.82	92.38	1.23	-1.39	3.23	-3.06	6.48	-4.68	9.72

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
MILES 1	1.74	0.37	3.87	0.74	5.53	1.11	0.33	2.22	0.25	4.45	0.16	6.68
MILES 2	2.24	0.37	4.00	0.74	5.73	1.11	0.32	2.22	0.22	4.45	0.13	6.68
MILES PLANT	3.36	0.37	7.38	0.74	10.77	1.11	0.29	2.22	0.11	4.45	-0.08	6.68
NORWALK 4	0.49	0.16	0.51	0.31	0.54	0.55	0.37	0.94	0.39	1.96	0.40	3.06
NORWALK 5	0.52	0.11	0.57	0.28	0.62	0.44	0.37	0.89	0.39	1.84	0.40	2.84
NORWALK PLANT	0.58	0.16	0.65	0.33	0.72	0.52	0.43	0.98	0.45	1.95	0.48	2.99
ORRVILLE 1	0.54*	0.28*	0.75*	0.56*	0.98*	0.86*	0.40*	1.69*	0.49*	3.75*	0.54*	5.98*
ORRVILLE 2	1.24*	0.27*	1.65*	0.54*	2.02*	0.80*	0.81*	1.65*	0.89*	3.38*	0.95*	5.00*
ORRVILLE PLANT	1.58*	0.27*	1.74*	0.55*	2.54*	0.82*	0.98*	1.67*	1.29*	3.54*	1.39*	5.38*

* Gross estimates of costs.

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
PAINESVILLE 1	1.30*	0.58*	2.16*	1.10*	3.15*	1.65*	0.45*	3.15*	0.65*	5.95*	0.81*	9.21*
PAINESVILLE PLANT	1.30*	0.58*	2.16*	1.10*	3.15*	1.65*	0.45*	3.15*	0.65*	5.95*	0.81*	9.21*
PHILO 4	2.01	0.34	3.50	0.68	4.99	1.02	0.30	2.91	0.20	5.83	0.09	8.74
PHILO 5	2.29	0.34	4.08	0.67	5.86	1.02	0.25	2.91	0.09	5.82	-0.07	8.74
PHILO 6	1.61	0.38	2.71	0.77	3.80	1.16	0.40	1.48	0.41	2.96	0.41	4.45
PHILO PLANT	5.02	0.36	9.39	0.72	13.74	1.08	0.25	2.31	-0.03	4.62	-0.33	6.94

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
PICWAY 1	0.639	0.24	0.798	0.51	0.955	0.78	0.389	1.63	0.410	3.33	0.427	4.99
PICWAY 2	0.653	0.24	0.826	0.51	0.995	0.78	0.388	1.63	0.406	3.33	0.421	4.99
PICWAY 3	1.141	0.22	1.781	0.44	2.413	0.66	0.379	1.63	0.375	3.27	0.365	4.90
PICWAY PLANT	1.548	0.24	2.512	0.48	3.465	0.72	0.505	1.66	0.529	3.31	0.544	4.96
PIQUA 1	0.602	0.56	0.716	1.13	0.825	1.70	0.490	0.73	0.602	1.48	0.708	2.24
PIQUA 2	0.535	0.56	0.589	1.11	0.640	1.67	0.430	0.71	0.489	1.45	0.546	2.19
PIQUA 3	0.672	1.20	0.854	2.44	1.034	3.68	0.485	1.76	0.590	3.58	0.693	5.37
PIQUA 4	0.666	1.20	0.841	2.44	1.014	3.65	0.486	1.76	0.592	3.58	0.696	5.34
PIQUA 5	0.714	2.04	0.932	4.08	1.15	6.17	0.485	3.31	0.589	6.63	0.692	10.04
PIQUA PLANT	1.362	0.81	2.021	1.92	2.67	2.89	1.07	1.40	1.599	2.81	2.077	4.72

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
POSTON 1	1.14	0.29	1.784	0.60	2.431	0.89	0.369	1.45	0.362	2.92	0.350	4.37
POSTON 2	1.51	0.29	2.51	0.59	3.51	0.87	0.362	1.56	0.341	3.12	0.313	4.68
POSTON PLANT	2.20	0.30	3.83	0.59	5.481	0.89	0.395	1.53	0.356	2.76	0.307	4.15
SAMMIS 1	4.12	0.42	7.73	0.85	11.34	1.28	0.39	1.83	0.42	3.67	0.43	5.50
SAMMIS 2	4.22	0.42	7.93	0.85	11.64	1.28	0.37	1.83	0.38	3.67	0.38	5.50
SAMMIS 3	7.69	0.29	14.92	0.58	22.14	0.87	0.50	1.63	0.52	3.28	0.62	4.91
SAMMIS 4	5.15	0.44	9.83	0.88	14.54	1.32	0.87	1.79	1.27	3.59	1.76	5.37
SAMMIS PLANT	19.59	0.37	3.80	0.75	58.49	1.12	1.12	1.74	1.77	3.49	2.73	5.23

Table 4-2; Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
STUART 1	2.73	0.21	4.89	0.41	7.15	0.61	0.52	0.78	0.60	1.56	0.76	2.35
STUART 2	2.64	0.21	4.70	0.41	6.87	0.61	0.53	0.78	0.64	1.56	0.82	2.35
STUART 3	2.41	0.21	4.24	0.41	6.18	0.61	0.58	0.78	0.73	1.56	0.95	2.35
STUART 4	1.94	0.21	3.31	0.41	4.78	0.61	0.66	0.78	0.89	1.56	1.20	2.35
STUART PLANT	8.23	0.21	15.58	0.41	23.66	0.61	1.20	0.78	1.71	1.56	2.81	2.35
TAIT 3	0.00	0.00	0.00	0.00	6.69	0.17	0.00	0.00	0.00	0.00	0.44	0.36
TAIT 4	0.00	0.00	0.00	0.00	7.27	0.17	0.00	0.00	0.00	0.00	0.43	0.36
TAIT PLANT	0.00	0.00	0.00	0.00	9.54	0.17	0.00	0.00	0.00	0.00	0.55	0.36
TIDD 1	1.33	0.51	2.17	1.04	3.00	1.58	0.36	2.92	0.32	5.88	0.28	8.85
TIDD 2	1.33	0.51	2.17	1.04	3.00	1.58	0.36	2.92	0.32	5.88	0.28	8.85
TIDD 3	1.74	0.37	3.84	0.74	5.53	1.11	0.33	2.22	0.25	4.45	0.16	6.68
TIDD PLANT	3.74	0.44	7.36	0.96	10.95	1.35	0.50	2.52	0.45	5.10	0.35	7.22

Table 4-2: Section 2. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Flue gas desulfurization											
	Nonregenerable wet limestone						Regenerable Wellman-Lord					
	Alternative 1		Alternative 2		Regulation		Alternative 1		Alternative 2		Regulation	
	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %	Annual O&M cost, $ MM	Fuel penalty %
TORONTO 12	2.06	0.42	3.59	0.83	5.13	1.25	0.45	2.00	0.49	3.99	0.52	6.00
TORONTO PLANT	2.06	0.42	3.59	0.83	5.13	1.25	0.45	2.00	0.45	3.99	0.52	6.00
WOODCOCK 1	0.00	0.00	0.00	0.00	2.61	0.34	0.00	0.00	0.00	0.00	0.39	1.08
WOODCOCK 2	0.00	0.00	0.00	0.00	5.56	0.37	0.00	0.00	0.00	0.00	0.39	0.97
WOODCOCK PLANT	0.00	0.00	0.00	0.00	6.70	0.38	0.00	0.00	0.00	0.00	0.46	1.07

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
ACME 4	0.27	0.20	0.27	0.32	0.27	0.32
ACME 16	0 071	0.23	0.071	0.22	0.071	0.21
ACME PLANT	0.34	0.43	0.34	0.54	0.34	0.53
ASHTABULA 4	0.22	0.14	0.22	0.20	0.22	0.20
ASHTABULA 5	0.18	0.24	0.18	0.35	0.18	0.35
ASHTABULA PLANT	0.40	0.38	0.40	0.55	0.40	0.55

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
AVON LAKE 5	0.08	0.12	0.08	0.14	0.08	0.18
AVON LAKE 6	0.08	0.10	0.08	0.14	0.08	0.17
AVON LAKE 7	0.23	0.13	0.23	0.19	0.23	0.20
AVON LAKE 8	0.46	0.28	0.46	0.88	0.46	0.92
AVON LAKE PLANT	0.85	0.63	0.85	1.35	0.85	1.47
BAYSHORE 1	0.14	0.13	0.14	0.19	0.14	0.19
BAYSHORE 2	0.14	0.13	0.14	0.20	0.14	0.20
BAYSHORE 3	0.14	0.14	0.14	0.20	0.14	0.20
BAYSHORE 4	0.21	0.31	0.21	0.32	0.21	0.32
BAYSHORE PLANT	0.63	0.71	0.63	0.91	0.63	0.84

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
BECKJORD 1	0.11	0.15	0.11	0.24	0.11	0.24
BECKJORD 2	0.11	0.12	0.11	0.26	0.11	0.26
BECKJORD 3	0.12	0.16	0.12	0.29	0.12	0.29
BECKJORD 4	0.16	0.13	0.16	0.29	0.16	0.29
BECKJORD 5	0.46	0.41	0.46	0.97	0.46	0.97
BECKJORD PLANT	0.96	0.97	0.96	2.05	0.96	2.05
BURGER 6	0.37	0.33	0.37	1.10	0.37	1.10
BURGER PLANT	0.37	0.33	0.37	1.10	0.37	1.10

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
CARDINAL 1	0.20	0.33	0.20	1.03	0.20	0.92
CARDINAL 2	0.20	0.33	0.20	0.99	0.20	0.92
CARDINAL PLANT	0.40	0.66	0.40	2.02	0.40	1.84
CLEVELAND 2	0.05*	0.09*	0.05*	0.09*	0.05*	0.09*
CLEVELAND 3	0.05*	0.09*	0.05*	0.09*	0.05*	0.09
CLEVELAND 4	0.05*	0.09*	0.05*	0.09*	0.05*	0.09
CLEVELAND 5	0.05*	0.09*	0.05*	0.09*	0.05*	0.09
CLEVELAND 6	0.07	0.21	0.07	0.22	0.07	0.23
CLEVELAND PLANT	0.27*	0.59*	0.27*	0.58*	0.27*	0.57*
CONESVILLE 1	0.24	0.10	0.24	0.16	0.24	0.16
CONESVILLE 2	0.12	0.09	0.12	0.09	0.12	0.12
CONESVILLE 3	0.53	0.33	0.53	0.37	0.53	0.43
CONESVILLE 4	0.36*	0.12*	0.36*	0.12*	0.36	0.13
CONESVILLE PLANT	0.89	0.81	0.89	0.79	0.89	0.84

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
EAST LAKE 1	0.12	0.12	0.12	0.14	0.12	0.20
EAST LAKE 2	0.12	0.12	0.12	0.20	0.12	0.20
EAST LAKE 3	0.12	0.12	0.12	0.20	0.12	0.20
EAST LAKE 4	0.20	0.11	0.20	0.11	0.20	0.14
EAST LAKE 5	0.46	0.30	0.46	0.81	0.46	0.81
EAST LAKE PLANT	1.02	0.77	1.02	1.52	1.02	1.55
EDGEWATER 1	0.17	0.10	0.17	0.14	0.17	0.21
EDGEWATER 2	0.10	0.11	0.10	0.20	0.10	0.22
EDGEWATER PLANT	0.27	0.21	0.27	0.34	0.27	0.43
GAVIN 1	1.77	1.42	1.77	1.61	1.77	1.74
GAVIN PLANT	1.77	1.42	1.77	1.61	1.77	1.74
GORGE 1	0.04	0.09	0.04	0.11	0.04	0.18
GORGE 2	0.04	0.09	0.04	0.12	0.04	0.22
GORGE PLANT	0.08	0.18	0.08	0.23	0.18	0.40

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
KYGER CREEK 1	0.36	0.12	0.36	0.12	0.36	0.13
KYGER CREEK 2	0.21	0.14	0.21	0.16	0.21	0.19
KYGER CREEK 3	0.36	0.21	0.36	0.21	0.36	0.27
KYGER CREEK PLANT	0.93	0.47	0.93	0.49	0.93	0.59
LAKESHORE 1	0.06	0.09	0.06	0.10	0.06	0.15
LAKESHORE 2	0.06	0.09	0.06	0.10	0.06	0.15
LAKESHORE 3	0.07	0.09	0.07	0.10	0.07	0.12
LAKESHORE 4	0.07	0.09	0.07	0.10	0.07	0.12
LAKESHORE 5	0.22	0.25	0.22	0.46	0.22	0.46
LAKESHORE PLANT	0.48	0.61	0.48	0.86	0.48	1.00

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
MIAMI FORT 1	0.28	0.15	0.28	0.30	0.28	0.36
MIAMI FORT 4	0.16	0.16	0.16	0.26	0.16	0.39
MIAMI FORT 5	0.25	0.33	0.25	0.50	0.25	0.92
MIAMI FORT PLANT	0.44	0.64	0.44	1.59	0.44	1.67
MUSKINGUM RIVER 1A	0.60	0.43	0.60	0.61	0.60	1.38
MUSKINGUM RIVER 2	0.40	0.18	0.40	0.30	0.40	0.99
MUSKINGUM RIVER PLT.	1.0	0.61	1.0	0.91	1.0	2.37

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP C&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
NILES 1	0.12	0.12	0.12	0.18	0.12	0.22
NILES 2	0.12	0.12	0.12	0.18	0.12	0.22
NILES PLANT	0.24	0.24	0.24	0.36	0.24	0.44
NORWALK 4	0.01	0.08	0.01	0.08	0.01	0.09
NORWALK 5	0.02	0.08	0.02	0.09	0.02	0.09
NORWALK PLANT	0.03	0.16	0.03	0.17	0.03	0.18
ORRVILLE 1	0.04*	0.17*	0.04*	0.17*	0.04*	0.17
ORRVILLE 2	0.05*	0.17*	0.05*	0.17*	0.05*	0.17
ORRVILLE PLANT	0.09*	0.34*	0.09*	0.34*	0.09*	0.34

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
PAINESVILLE 1	0.03*	0.14*	0.03*	0.14*	0.03*	0.14
PAINESVILLE PLANT	0.03*	0.14*	0.03*	0.14*	0.03*	0.14
PHILO 4	0.17	0.11	0.17	0.18	0.17	0.19
PHILO 5	0.17	0.11	0.17	0.18	0.17	0.19
PHILO 6	0.12	0.11	0.12	0.16	0.12	0.18
PHILO PLANT	0.46	0.33	0.46	0.52	0.46	0.56

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
PICWAY 1	0.03	0.09	0.03	0.09	0.03	0.09
PICWAY 2	0.03	0.09	0.03	0.09	0.03	0.09
PICWAY 3	0.08	0.00	0.08	0.10	0.08	0.11
PICWAY PLANT	0.14	0.18	0.14	0.28	0.14	0.29
PIQUA 1	0.06		0.06		0.06	
PIQUA 2	0.03		0.03		0.03	
PIQUA 3	0.03	0.08	0.03	0.09	0.03	0.10
PIQUA 4	0.03	0.08	0.03	0.09	0.03	0.10
PIQUA 5	0.02	0.08	0.02	0.09	0.02	0.10
PIQUA PLANT	0.17	0.24	0.17	0.27	0.17	0.30

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
POSTON 1	0.08	0.09	0.08	0.09	0.08	0.10
POSTON 2	0.12	0.00	0.12	0.10	0.12	0.19
POSTON PLANT	0.20	0.09	0.20	0.19	0.20	0.29
SAMMIS 1	0.31	0.20	0.31	0.40	0.31	0.40
SAMMIS 2	0.31	0.20	0.31	0.40	0.31	0.40
SAMMIS 3	0.64	0.28	0.64	0.66	0.64	0.66
SAMMIS 4	0.42	0.24	0.42	0.62	0.42	0.62
SAMMIS PLANT	1.68	0.92	1.68	2.08	1.68	2.08

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western low Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
STUART 1	0.41	0.12	0.41	0.13	0.41	0.23
STUART 2	0.41	0.12	0.41	0.13	0.41	0.22
STUART 3	0.41	0.11	0.41	0.13	0.41	0.22
STUART 4	0.41	0.11	0.41	0.13	0.41	0.21
STUART PLANT	1.64	0.46	1.64	0.52	1.64	0.88
TAIT 3	0.14		0.14		0.14	
TAIT 4	0.14		0.14		0.14	
TAIT PLANT	0.28		0.28		0.28	
TIDD 1	0.04	0.09	0.04	0.11	N/A[a]	N/A[a]
TIDD 2	0.04	0.09	0.04	0.11	N/A[a]	N/A[a]
TIDD 3	0.12	0.11	0.12	0.16	N/A[a]	N/A[a]
TIDD PLANT	0.20	0.29	0.20	0.38	N/A[a]	N/A[a]

[a] Western coals will not meet 0.8% S regulation.

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western low Btu / Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
TORONTO 12	0.17	0.18	0.17	0.18	0.17	0.33
TORONTO PLANT	0.17	0.18	0.17	0.18	0.17	0.33
WOODCOCK 1	0.02		0.02		0.02	0.09
WOODCOCK 2	0.02		0.02		0.02	0.10
WOODCOCK PLANT	0.04		0.04		0.04	0.19

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
ACME 4	0.00	0.00	0.00	0.20	0.00	0.32
ACME 16	0.00	0.11	0.00	0.11	0.00	0.16
ACME PLANT	0.00	0.11	0.00	0.31	0.00	0.48
ASHTABULA 5	0.00	0.19	0.00	0.23	0.00	0.35
ASHTABULA 4	0.00	0.12	0.00	0.14	0.00	0.20
ASHTABULA PLANT	0.00	0.31	0.00	0.37	0.00	0.55

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western high Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
AVON LAKE 5	0.00	0.10	0.00	0.12	0.00	0.14
AVON LAKE 6	0.00	0.10	0.00	0.12	0.00	0.14
AVON LAKE 7	0.00	0.13	0.00	0.20	0.00	0.20
AVON LAKE 8	0.00	0.25	0.00	0.28	0.00	0.28
AVON LAKE PLANT	0.00	0.58	0.00	0.72	0.00	0.76
BAYSHORE 1	0.00	0.00	0.00	0.12	0.00	0.19
BAYSHORE 2	0.00	0.00	0.00	0.12	0.00	0.20
BAYSHORE 3	0.00	0.00	0.00	0.12	0.00	0.29
BAYSHORE 4	0.00	0.00	0.00	0.15	0.00	0.32
BAYSHORE PLANT	0.00	0.00	0.00	0.51	0.00	1.00

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
BECKJORD 1	0.00	0.11	0.00	0.15	0.00	0.24
BECKJORD 2	0.00	0.10	0.00	0.11	0.00	0.26
BECKJORD 3	0.00	0.11	0.00	0.12	0.00	0.29
BECKJORD 4	0.00	0.11	0.00	0.13	0.00	0.19
BECKJORD 5	0.00	0.26	0.00	0.37	0.00	0.40
BECKJORD PLANT	0.00	0.69	0.00	0.88	0.00	1.08
BURGER 6	0.00	0.28	0.00	0.33	0.00	1.09
BURGER PLANT	0.00	0.28	0.00	0.33	0.00	1.09

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western high Btu / Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
CARDINAL 1	0.00	0.24	0.00	0.33	0.00	0.91
CARDINAL 2	0.00	0.24	0.00	0.33	0.00	0.91
CARDINAL PLANT	0.00	0.48	0.00	0.66	0.00	1.82
CLEVELAND 2	0.00	0.00	0.00	0.00	0.00*	0.00
CLEVELAND 3	0.00	0.00	0.00	0.00	0.00	0.00
CLEVELAND 4	0.00	0.00	0.00	0.00	0.00	0.00
CLEVELAND 5	0.00	0.00	0.00	0.00	0.00	0.00
CLEVELAND 6	0.00	0.11	0.00	0.11	0.00	0.16
CLEVELAND PLANT	0.00	0.11	0.00	0.11	0.00	0.16
CONESVILLE 1	0.00	0.00	0.00	0.00	0.00	0.12
CONESVILLE 2	0.00	0.00	0.00	0.09	0.00	0.10
CONESVILLE 3	0.00	0.00	0.00	0.00	0.00	0.32
CONESVILLE 4	0.00	0.00	0.00	0.11	0.00	0.12
CONESVILLE PLANT	0.00	0.00	0.00	0.20	0.00	0.66

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western high Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
EAST LAKE 1	0.00	0.10	0.00	0.12	0.00	0.20
EAST LAKE 2	0.00	0.11	0.00	0.13	0.00	0.21
EAST LAKE 3	0.00	0.10	0.00	0.12	0.00	0.20
EAST LAKE 4	0.00	0.09	0.00	0.10	0.00	0.13
EAST LAKE 5	0.00	0.25	0.00	0.42	0.00	0.80
EAST LAKE PLANT	0.00	0.65	0.00	0.62	0.00	1.54
EDGEWATER 1	0.00	0.10	0.00	0.11	0.00	0.21
EDGEWATER 2	0.00	0.10	0.00	0.11	0.00	0.13
EDGEWATER PLANT	0.00	0.20	0.00	0.21	0.00	0.33
GAVIN 1	0.00	0.00	0.00	0.00	0.00	1.33
GAVIN PLANT	0.00	0.00	0.00	0.00	0.00	1.33
GORGE 1	0.00	0.09	0.00	0.11	0.00	0.11
GORGE 2	0.00	0.09	0.00	0.11	0.00	0.11
GORGE PLANT	0.00	0.18	0.00	0.22	0.00	0.22

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western high Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
KYGER CREEK 1	0.00	0.00	0.00	0.11	0.00	0.12
KYGER CREEK 2	0.00	0.00	0.00	0.12	0.00	0.15
KYGER CREEK 3	0.00	0.00	0.00	0.15	0.00	0.22
KYGER CREEK PLANT	0.00	0.00	0.00	0.38	0.00	0.49
LAKESHORE 1	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 2	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 3	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 4	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 5	0.00	0.11	0.00	0.33	0.00	0.36
LAKESHORE PLANT	0.00	0.43	0.00	0.65	0.00	0.70

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Western high Btu					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
MIAMI FORT 3	0.00	0.11	0.00	0.15	0.00	0.33
MIAMI FORT 4	0.00	0.11	0.00	0.16	0.00	0.36
MIAMI FORT 5	0.00	0.24	0.00	0.33	0.00	0.91
MIAMI FORT PLANT	0.00	0.46	0.00	0.64	0.00	1.60
MUSKINGUM RIVER 1A	0.00	0.00	0.00	0.43	0.00	0.61
MUSKINGUM RIVER 2	0.00	0.00	0.00	0.26	0.00	0.26
MUSKINGUM RIVER PLT.	0.00	0.00	0.00	0.87	0.00	0.61

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
NILES 1	0.00	0.10	0.00	0.11	0.00	0.22
NILES 2	0.00	0.10	0.00	0.12	0.00	0.22
NILES PLANT	0.00	0.20	0.00	0.23	0.00	0.44
NORWALK 4	0.00	0.08	0.00	0.08	0.00	0.08
NORWALK 5	0.00	0.00	0.00	0.08	0.00	0.08
NORWALK PLANT	0.00	0.08	0.00	0.16	0.00	0.16
ORRVILLE 1	0.00	0.00	0.00	0.00	0.00	0.17
ORRVILLE 2	0.00	0.00	0.00	0.00	0.00	0.17
ORRVILLE PLANT	0.00	0.00	0.00	0.00	0.00	0.34

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
PAINESVILLE 1	0.03	0.03	0.03	0.03	0.03*	0.14
PAINESVILLE PLANT	0.03	0.03	0.03	0.03	0.03*	0.14
PHILO 4	0.00	0.09	0.00	0.09	0.00	0.19
PHILO 5	0.00	0.09	0.00	0.11	0.00	0.19
PHILO 6	0.00	0.09	0.00	0.11	0.00	0.18
PHILO PLANT	0.00	0.38	0.00	0.39	0.00	0.56

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
PICWAY 1	0.00	0.00	0.00	0.00	0.00	0.00
PICWAY 2	0.00	0.00	0.00	0.00	0.00	0.00
PICWAY 3	0.00	0.00	0.00	0.00	0.00	0.00
PICWAY PLANT	0.00	0.00	0.00	0.00	0.00	0.00
PIQUA 1	0.00	0.00	0.00	0.00	0.00	0.00
PIQUA 2	0.00	0.00	0.00	0.00	0.00	0.00
PIQUA 3	0.00	0.08	0.00	0.08	0.00	0.09
PIQUA 4	0.00	0.08	0.00	0.08	0.00	0.09
PIQUA 5	0.00	0.08	0.00	0.08	0.00	0.08
PIQUA PLANT	0.00	0.24	0.00	0.24	0.00	0.26

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Low sulfur coal, Western high Btu, Alternative 1 cost: ESP O&M, $ MM/yr	Low sulfur coal, Western high Btu, Alternative 2 cost: Boiler modification O&M, $ MM/yr	Low sulfur coal, Western high Btu, Alternative 2 cost: ESP O&M, $ MM/yr	Low sulfur coal, Western high Btu, Regulation cost: Boiler modification O&M, $ MM/yr	Low sulfur coal, Western high Btu, Regulation cost: ESP O&M, $ MM/yr
POSTON 1	0.00	0.09	0.00	0.09	0.00	0.11
POSTON 2	0.00	0.00	0.00	0.09	0.00	0.11
POSTON PLANT	0.00	0.09	0.00	0.18	0.00	0.22
SAMMIS 1	0.00	0.19	0.00	0.19	0.00	0.40
SAMMIS 2	0.00	0.19	0.00	0.20	0.00	0.40
SAMMIS 3	0.00	0.27	0.00	0.28	0.00	0.66
SAMMIS 4	0.00	0.23	0.00	0.24	0.00	0.62
SAMMIS PLANT	0.00	0.88	0.00	0.91	0.00	2.08

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Western high Btu, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
STUART 1	0.00	0.00	0.00	0.00	0.00	0.10
STUART 2	0.00	0.00	0.00	0.00	0.00	0.10
STUART 3	0.00	0.00	0.00	0.00	0.00	0.10
STUART 4	0.00	0.00	0.00	0.00	0.00	0.10
STUART PLANT	0.00	0.00	0.00	0.00	0.00	0.40
TAIT 3	0.00	0.00	0.00	0.00	0.00	0.00
TAIT 4	0.00	0.00	0.00	0.00	0.00	0.00
TAIT PLANT	0.00	0.00	0.00	0.00	0.00	0.00
TIDD 1	0.00	0.09	0.00	0.11	0.00	0.11
TIDD 2	0.00	0.09	0.00	0.11	0.00	0.11
TIDD 3	0.00	0.09	0.00	0.11	0.00	0.18
TIDD PLANT	0.00	0.27	0.00	0.41	0.00	0.40

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal / Western high Btu — Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
TORONTO 12	0.00	0.13	0.00	0.16	0.00	0.17
TORONTO PLANT	0.00	0.13	0.00	0.16	0.00	0.17
WOODCOCK 1	0.00	0.00	0.00	0.00	0.00	0.09
WOODCOCK 2	0.00	0.00	0.00	0.00	0.00	0.09
WOODCOCK PLANT	0.00	0.00	0.00	0.00	0.00	0.18

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
ACME 4	0.00	0.00	0.00	0.19	0.00	0.32
ACME 16	0.00	0.10	0.00	0.11	0.00	0.18
ACME PLANT	0.00	0.10	0.00	0.30	0.00	0.50
ASHTABULA 5	0.00	0.11	0.00	0.14	0.00	0.20
ASHTABULA 4	0.00	0.18	0.00	0.24	0.00	0.35
ASHTABULA PLANT	0.00	0.29	0.00	0.38	0.00	0.55

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
AVON LAKE 5	0.00	0.10	0.00	0.12	0.00	0.14
AVON LAKE 6	0.00	0.10	0.00	0.12	0.00	0.14
AVON LAKE 7	0.00	0.11	0.00	0.13	0.00	0.20
AVON LAKE 8	0.00	0.24	0.00	0.28	0.00	0.93
AVON LAKE PLANT	0.00	0.55	0.00	0.65	0.00	1.41
BAYSHORE 1	0.00	0.00	0.00	0.11	0.00	0.20
BAYSHORE 2	0.00	0.00	0.00	0.11	0.00	0.20
BAYSHORE 3	0.00	0.00	0.00	0.12	0.00	0.20
BAYSHORE 4	0.00	0.00	0.00	0.15	0.00	0.32
BAYSHORE PLANT	0.00	0.00	0.00	0.49	0.00	0.92

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
BECKJORD 1	0.00	0.11	0.00	0.13	0.00	0.24
BECKJORD 2	0.00	0.10	0.00	0.11	0.00	0.26
BECKJORD 3	0.00	0.10	0.00	0.12	0.00	0.29
BECKJORD 4	0.00	0.11	0.00	0.12	0.00	0.19
BECKJORD 5	0.00	0.20	0.00	0.36	0.00	0.97
BECKJORD PLANT	0.00	0.62	0.00	0.84	0.00	1.95
BURGER 6	0.00	0.27	0.00	0.33	0.00	0.41
BURGER PLANT	0.00	0.27	0.00	0.33	0.00	0.11

Table 4.2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
CARDINAL 1	0.00	0.23	0.00	0.33	0.00	0.93
CARDINAL 2	0.00	0.23	0.00	0.33	0.00	0.90
CARDINAL PLANT	0.00	0.46	0.00	0.66	0.00	1.83
CLEVELAND 2	0.00	0.09	0.00	0.09	0.00	0.09
CLEVELAND 3	0.00	0.09	0.00	0.09	0.00	0.09
CLEVELAND 4	0.00	0.09	0.00	0.09	0.00	0.09
CLEVELAND 5	0.00	0.09	0.00	0.09	0.00	0.09
CLEVELAND 6	0.00	0.10	0.00	0.11	0.00	0.18
CLEVELAND PLANT	0.00	0.46	0.00	0.47	0.00	0.54
CONESVILLE 1	0.00	0.00	0.00	0.00	0.00	0.11
CONESVILLE 2	0.00	0.00	0.00	0.00	0.00	0.09
CONESVILLE 3	0.00	0.00	0.00	0.00	0.00	0.28
CONESVILLE 4	0.00	0.00	0,00	0.11	0.00	0.12
CONESVILLE PLANT	0.00	0.00	0.00	0.00	0.00	0.60

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
EAST LAKE 1	0.00	0.09	0.00	0.09	0.00	0.20
EAST LAKE 2	0.00	0.11	0.00	0.13	0.00	0.21
EAST LAKE 3	0.00	0.09	0.00	0.09	0.00	0.20
EAST LAKE 4	0.00	0.09	0.00	0.10	0.00	0.13
EAST LAKE 5	0.00	0.25	0.00	0.26	0.00	0.81
EAST LAKE PLANT	0.00	0.63	0.00	0.64	0.00	1.55
EDGEWATER 1	0.00	0.10	0.00	0.10	0.00	0.21
EDGEWATER 2	0.00	0.10	0.00	0.11	0.00	0.12
EDGEWATER PLANT	0.00	0.20	0.00	0.21	0.00	0.33
GAVIN 1	0.00	0.00	0.00	0.00	0.00	1.28
GAVIN PLANT	0.00	0.00	0.00	0.00	0.00	1.28
GORGE 1	0.00	0.09	0.00	0.11	0.00	0.11
GORGE 2	0.00	0.00	0.00	0.11	0.00	0.11
GORGE PLANT	0.00	0.09	0.00	0.22	0.00	0.22

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
KYGER CREEK 1	0.00	0.00	0.00	0.11	0.00	0.12
KYGER CREEK 2	0.00	0.00	0.00	0.12	0.00	0.15
KYGER CREEK 3	0.00	0.00	0.00	0.15	0.00	0.21
KYGER CREEK PLANT	0.00	0.00	0.00	0.38	0.00	0.48
LAKESHORE 1	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 2	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 3	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 4	0.00	0.08	0.00	0.08	0.00	0.09
LAKESHORE 5	0.00	0.11	0.00	0.12	0.00	0.46
LAKESHORE PLANT	0.00	0.43	0.00	0.44	0.00	0.82

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal, Eastern, Alternative 1 cost: Boiler modification O&M, $ MM/yr	Alternative 1 cost: ESP O&M, $ MM/yr	Alternative 2 cost: Boiler modification O&M, $ MM/yr	Alternative 2 cost: ESP O&M, $ MM/yr	Regulation cost: Boiler modification O&M, $ MM/yr	Regulation cost: ESP O&M, $ MM/yr
MIAMI FORT 3	0.00	0.11	0.00	0.15	0.00	0.33
MIAMI FORT 4	0.00	0.11	0.00	0.16	0.00	0.26
MIAMI FORT 5	0.00	0.23	0.00	0.33	N/A	N/A
MIAMI FORT PLANT	0.00	0.45	0.00	0.64	0.00	0.59
MUSKINGUM RIVER 1A	0.00	0.00	0.00	0.42	0.00	0.60
MUSKINGUM RIVER 2	0.00	0.00	0.00	0.18	0.00	0.30
MUSKINGUM RIVER PLT.	0.00	0.00	0.00	0.60	0.00	0.90

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
NILES 1	0.00	0.10	0.00	0.12	0.00	0.23
NILES 2	0.00	0.10	0.00	0.12	0.00	0.24
NILES PLANT	0.00	0.20	0.00	0.24	0.00	0.47
NORWALK 4	0.00	0.08	0.00	0.08	0.00	0.08
NORWALK 5	0.00	0.08	0.00	0.08	0.00	0.08
NORWALK PLANT	0.00	0.16	0.00	0.16	0.00	0.16
ORRVILLE 1	0.00	0.00	0.00	0.00	0.00	0.17
ORRVILLE 2	0.00	0.00	0.00	0.00	0.00	0.17
ORRVILLE PLANT	0.00	0.00	0.00	0.00	0.00	0.34

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
PAINESVILLE 1	0.00	0.00*	0.00*	0.00*	0.00	0.00*
PAINESVILLE PLANT	0.00	0.00*	0.00	0.00*	0.00	0.00*
PHILO 4	0.00	0.00	0.00	0.11	0.00	0.19
PHILO 5	0.00	0.00	0.00	0.11	0.00	0.19
PHILO 6	0.00	0.00	0.00	0.11	0.00	0.18
PHILO PLANT	0.00	0.00	0.00	0.33	0.00	0.56

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
PICWAY 1	0.00	0.09	0.00	0.09	0.00	0.09
PICWAY 2	0.00	0.09	0.00	0.09	0.00	0.09
PICWAY 3	0.00	0.09	0.00	0.10	0.00	0.11
PICWAY PLANT	0.00	0.27	0.00	0.28	0.00	0.29
PIQUA 1	0.00	0.00	0.00	0.00	0.00	0.00
PIQUA 2	0.00	0.00	0.00	0.00	0.00	0.00
PIQUA 3	0.00	0.08	0.00	0.08	0.00	0.09
PIQUA 4	0.00	0.08	0.00	0.08	0.00	0.09
PIQUA 5	0.00	0.08	0.00	0.08	0.00	0.09
PIQUA PLANT	0.00	0.24	0.00	0.24	0.00	0.27

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
POSTON 1	0.00	0.09	0.00	0.09	0.00	0.11
POSTON 2	0.00	0.00	0.00	0.09	0.00	0.11
POSTON PLANT	0.00	0.09	0.00	0.18	0.00	0.22
SAMMIS 1	0.00	0.19	0.00	0.19	0.00	0.40
SAMMIS 2	0.00	0.19	0.00	0.19	0.00	0.40
SAMMIS 3	0.00	0.27	0.00	0.28	0.00	0.66
SAMMIS 4	0.00	0.23	0.00	0.23	0.00	0.62
SAMMIS PLANT	0.00	0.88	0.00	0.89	0.00	2.08

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
STUART 1	0.00	0.00	0.00	0.00	0.00	0.10
STUART 2	0.00	0.00	0.00	0.00	0.00	0.10
STUART 3	0.00	0.00	0.00	0.00	0.00	0.10
STUART 4	0.00	0.00	0.00	0.00	0.00	0.10
STUART PLANT	0.00	0.00	0.00	0.00	0.00	0.40
TAIT 3	0.00	0.00	0.00	0.00	0.00	0.00
TAIT 4	0.00	0.00	0.00	0.00	0.00	0.00
TAIT PLANT	0.00	0.00	0.00	0.00	0.00	0.00
TIDD 1	0.00	0.09	0.00	0.11	N/A[a]	N/A[a]
TIDD 2	0.00	0.09	0.00	0.11	N/A[a]	N/A[a]
TIDD 3	0.00	0.00	0.00	0.11	N/A[a]	N/A[a]
TIDD PLANT	0.00	0.18	0.00	0.33	N/A[a]	N/A[a]

[a] Eastern coals will not meet 0.8% S regulation.

Table 4.2; Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Low sulfur coal					
	Eastern					
	Alternative 1 cost		Alternative 2 cost		Regulation cost	
	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr	Boiler modification O&M, $ MM/yr	ESP O&M, $ MM/yr
TORONTO 12	0.00	0.13	0.00	0.16	0.00	0.18
TORONTO PLANT	0.00	0.13	0.00	0.16	0.00	0.18
WOODCOCK 1	0.00	0.00	0.00	0.00	0.00	0.09
WOODCOCK 2	0.00	0.00	0.00	0.00	0.00	0.09
WOODCOCK PLANT	0.00	0.00	0.00	0.00	0.00	0.18

Table 4.2; Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending — Eastern Low Sta — Alternative I — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade	Coal Blending — Eastern Low Sta — Alternative II — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade	Scrubbing — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade
ACME 4	143,400	99,600	0.043	0.11	0.30	73,000	101,700	0.043	0.30	0.32	3,700	287,700	0.043	0.37	0.50
ACME 16	100,100	47,900	0.043	0.00	0.23	73,300	80,300	0.043	0.04	0.22	300,100	143,000	0.043	0.06	0.21
ACME PLANT	251,500	143,500	0.043	0.11	0.43	146,300	287,000	0.044	0.34	0.54	302,000	431,100	0.043	0.33	0.63
ADVIANKA 4	430,010	303,224	0.043	0.00	0.14	233,700	500,900	0.043	0.16	0.30	5,600	647,100	0.043	0.22	0.20
ADVIANKA 5	340,600	233,300	0.043	0.07	0.24	170,100	455,900	0.043	0.13	0.30	5,300	607,300	0.043	0.10	0.30
ADVIANKA PLANT	760,310	514,524	0.043	0.10	0.38	307,000	1,031,700	0.044	0.30	0.55	11,000	1,344,300	0.044	0.4	0.59

Table 4.2; Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending — Eastern Low Sta — Alternative I — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade	Coal Blending — Eastern Low Sta — Alternative II — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade	Scrubbing — Coal required, tons: Existing	Coal required, tons: Low sulfur	Costs, $ MM: Blending	Costs, $ MM: Boiler modification	Costs, $ MM: FGD upgrade
AVON LAKE 5	104,100	97,500	0.043	0.03	0.12	113,000	105,000	0.043	0.05	0.14	43,100	203,900	0.043	0.07	0.10
AVON LAKE 6	150,200	90,100	0.043	0.03	0.10	97,000	160,300	0.043	0.05	0.14	37,000	253,000	0.043	0.07	0.17
AVON LAKE 7	302,300	199,100	0.043	0.00	0.13	199,000	307,000	0.043	0.16	0.10	66,000	126,900	0.043	0.30	0.20
AVON LAKE 8	1,406,100	712,300	0.043	0.10	0.20	537,000	1,434,300	0.045	0.34	0.68	14,000	2,126,500	0.047	0.20	0.02
AVON LAKE PLANT	1,665,100	1,002,700	0.046	0.14	0.63	808,500	2,105,000	0.043	0.00	1.35	161,200	3,309,000	0.050	0.54	1.47
BATAVIAS 1	236,000	133,900	0.043	0.05	0.13	146,500	267,400	0.043	0.00	0.10	94,000	400,900	0.043	0.12	0.10
BATAVIAS 2	247,700	140,300	0.043	0.05	0.13	152,300	280,000	0.043	0.00	0.30	96,900	419,000	0.043	0.12	0.13
BATAVIAS 3	243,000	137,900	0.043	0.05	0.14	149,000	276,100	0.043	0.00	0.30	95,900	411,000	0.043	0.12	0.30
BATAVIAS 4	279,000	333,300	0.043	0.00	0.31	300,300	503,100	0.043	0.15	0.32	42,900	745,900	0.043	0.30	0.32
BATAVIAS PLANT	1,106,300	665,600	0.044	0.23	0.71	646,400	1,326,100	0.045	0.42	0.81	310,100	1,970,400	0.048	0.56	0.84

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Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western Low Btu														
	Alternative 1					Alternative 2					Scrubbers				
	Coal required, tons		Capital $ MM			Coal required, tons		Capital $ MM			Coal required, tons		Capital $ MM		
	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade
CLEVELAND 1	120,300	76,300	0.042	0.04	0.15	61,000	153,000	0.042	0.00	0.74	3,000	230,000	0.042	0.11	0.84
CLEVELAND 2	140,000	81,000	0.043	0.04	0.15	67,000	167,000	0.042	0.00	0.06	3,000	251,000	0.043	0.11	0.84
CLEVELAND 3	177,000	105,100	0.042	0.04	0.16	85,000	211,000	0.042	0.00	0.00	3,000	316,000	0.043	0.13	0.00
CLEVELAND 4	256,000	152,000	0.043	0.00	0.15	123,200	305,000	0.042	0.11	0.00	4,000	458,000	0.043	0.16	0.00
CLEVELAND 5	593,000	340,000	0.043	0.31	0.41	443,300	1,100,000	0.046	0.10	0.07	24,000	1,703,000	0.000	0.40	0.07
CLEVELAND PLANT	1,435,700	960,300	0.046	0.00	0.07	700,000	1,736,100	0.000	0.00	0.00	20,000	2,610,700	0.0010	0.07	0.00
GREENS 6	704,300	000,000	0.012	0.10	0.10	300,000	1,014,300	0.044	0.07	1.10	9,700	1,522,000	0.046	0.09	1.10
GREENS PLANT	900,300	599,000	0.013	0.10	0.10	300,000	1,014,300	0.044	0.07	1.10	9,700	1,522,000	0.046	0.09	1.10

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western Low Btu														
	Alternative 1					Alternative 2					Scrubbers				
	Coal required, tons		Capital $ MM			Coal required, tons		Capital $ MM			Coal required, tons		Capital $ MM		
	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade	Existing	Low sulfur	Standing	Boiler modification	ESP upgrade
CLASSIC 1	670,400	644,300	0.043	0.00	0.33	441,300	1,006,000	0.000	0.14	0.00	12,100	1,020,300	0.047	0.2	0.00
CLASSIC 2	670,400	644,300	0.043	0.00	0.33	441,300	1,006,000	0.043	0.14	0.00	12,100	1,020,300	0.047	0.2	0.00
CLASSIC PLANT	1,340,000	1,000,000	0.000	0.14	0.66	000,000	2,171,300	0.000	0.00	1.00	20,200	2,200,000	0.003	0.4	1.04
CLEVELAND 2	21,000	00,300	0.03*	0.00	0.00*	14,000	30,000	0.03*	0.03*	0.00*	0,700	00,000	0.03*	0.00*	0.00
CLEVELAND 3	21,000	00,300	0.03*	0.00	0.00*	14,000	30,000	0.03*	0.03*	0.00*	0,700	00,000	0.03*	0.00*	0.00
CLEVELAND 4	21,000	00,300	0.03*	0.00	0.00*	14,000	30,000	0.03*	0.03*	0.00*	0,700	00,000	0.03*	0.00*	0.00
CLEVELAND 5	21,000	00,300	0.03*	0.00	0.00*	14,000	30,000	0.03*	0.03*	0.00*	0,700	00,000	0.03*	0.00*	0.00
CLEVELAND 6	100,100	67,000	0.04	0.00	0.31	73,300	95,300	0.04	0.04	0.33	30,000	142,000	0.04	0.00	0.33
CLEVELAND PLANT	193,700	000,100	0.00*	0.00	0.00*	139,000	000,300	0.04*	0.04*	0.50	00,000	301,000	0.04*	0.00*	0.07*
GREENVILLE 1	210,000	172,300	0.042	0.00	0.10	010,700	200,000	0.042	0.11	0.10	000,000	000,100	0.043	0.10	0.10
GREENVILLE 2	210,000	107,100	0.042	0.03	0.00	212,000	207,000	0.043	0.00	0.00	222,000	210,000	0.043	0.09	0.13
GREENVILLE 3	1,000,000	000,000	0.042	0.10	0.33	1,100,000	000,300	0.044	0.20	0.37	000,000	1,222,000	0.040	0.33	0.43
GREENVILLE 4	170,200	100,000	0.04*	0.11*	0.13*	010,000	200,000	0.04*	0.02*	0.12*	000,000	000,000	0.04*	0.00*	0.13*
GREENVILLE PLANT	2,000,100	1,000,200	0.000	0.00	0.00	2,200,000	1,000,700	0.000	0.00	0.70	2,000,000	2,000,000	0.001	0.03	0.00

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western Low Sulfur													
	Alternative 1					Alternative 2					Scrubber			
	Coal required, tons/hr		Capital Cost, $ MM			Coal required, tons/hr		Capital Cost, $ MM			Coal required, tons/hr		Capital Cost, $ MM	
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
[illegible]	341,100	337,000	0.003	0.04	0.13	343,000	370,000	0.003	0.03	0.14	47,100	414,000	0.003	0.11	0.00
[illegible]	289,000	130,000	0.003	0.04	0.13	130,000	303,100	0.003	0.04	0.00	48,700	304,000	0.003	0.11	0.00
[illegible]	343,000	130,100	0.003	0.04	0.13	140,100	370,000	0.003	0.04	0.00	47,000	410,100	0.003	0.11	0.00
[illegible]	307,300	100,300	0.003	0.00	0.11	170,000	300,000	0.003	0.14	0.11	33,700	000,700	0.003	0.10	0.14
[illegible]	943,000	902,000	0.003	0.10	0.30	431,000	1,102,000	0.003	0.34	0.01	24,000	1,770,140	0.007	0.00	0.01
[illegible]	3,004,000	1,100,000	0.000	0.30	0.77	1,000,000	2,102,300	0.000	0.72	1.00	107,000	3,100,000	0.003	0.00	1.00
[illegible]	00,000	07,300	0.003	0.07	0.10	40,000	110,000	0.003	0.13	0.14	0,000	170,300	0.003	0.14	0.01
[illegible]	103,100	100,300	0.003	0.04	0.11	117,300	311,700	0.003	0.00	0.30	43,000	316,000	0.003	0.00	0.03
[illegible]	303,100	102,000	0.003	0.11	0.31	107,00	300,700	0.003	0.10	0.30	03,300	000,100	0.003	0.33	0.03
[illegible]	3,110,300	014,700	0.003	0.30	1.10	3,001,000	1,000,000	0.007	0.00	1.01	3,000,000	2,701,00	0.000	0.07	1.70
[illegible]	3,113,700	014,700	0.000	0.30	1.00	3,001,000	1,000,000	0.007	0.00	1.01	0,000,000	2,701,000	0.000	0.07	1.70
[illegible]	133,700	02,000	0.003	0.01	0.00	07,000	100,700	0.003	0.03	0.11	01,000	107,000	0.003	0.03	0.10
[illegible]	137,700	00,000	0.003	0.01	0.00	03,000	110,100	0.003	0.03	0.10	30,000	170,000	0.003	0.03	0.10
[illegible]	031,000	131,000	0.003	0.03	0.10	170,000	003,000	0.003	0.01	0.00	00,700	300,000	0.001	0.00	0.00

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal Blending Western Low Sulfur													
	Alternative 1					Alternative 2					Scrubber			
	Coal required, tons/hr		Capital Cost, $ MM			Coal required, tons/hr		Capital Cost, $ MM			Coal required, tons/hr		Capital Cost, $ MM	
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
[illegible]	1,070,000	710,300	0.003	0.00	0.13	010,000	000,000	0.003	0.13	0.13	757,000	000,300	0.003	0.17	0.13
[illegible]	003,100	110,000	0.003	0.14	0.14	003,000	333,100	0.003	0.07	0.10	301,000	333,000	0.003	0.10	0.10
[illegible]	1,100,700	333,000	0.003	0.00	0.31	070,000	000,700	0.003	0.13	0.31	005,000	702,100	0.003	0.17	0.27
[illegible]	2,700,000	000,300	0.000	0.30	0.07	2,203,000	1,313,700	0.007	0.31	0.00	1,000,700	1,000,300	0.005	0.00	0.00
[illegible]	70,100	11,000	0.001	0.01	0.00	00,300	00,100	0.003	0.03	0.10	20,000	00,000	0.003	0.04	0.10
[illegible]	77,300	13,100	0.001	0.01	0.00	00,100	00,000	0.003	0.03	0.10	31,000	73,000	0.003	0.04	0.10
[illegible]	131,000	20,000	0.001	0.01	0.00	00,300	02,000	0.003	0.03	0.10	00,300	100,300	0.003	0.05	0.13
[illegible]	131,000	20,000	0.001	0.01	0.00	00,300	02,000	0.003	0.03	0.10	00,300	100,300	0.003	0.05	0.13
[illegible]	003,000	100,100	0.003	0.00	0.25	200,100	033,700	0.003	0.11	0.00	31,000	003,000	0.003	0.13	0.00
[illegible]	033,000	330,000	0.003	0.10	0.01	011,000	370,000	0.000	0.30	0.00	107,000	1,110,000	0.000	0.23	1.00

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western low Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
MIAMI FORT 3	256,300	169,400	0.042	0.11	0.15	129,600	129,600	0.043	0.30	0.30	3,600	[illegible]	0.043	0.28	0.36
MIAMI FORT 4	1,273,100	841,[illegible]	0.043	0.60	0.16	643,000	1,603,000	0.045	0.12	0.26	14,600	2,536,000	0.047	0.16	0.30
MIAMI FORT 5	769,000	645,000	0.09	0.13	0.33	540,000	1,287,000	0.10	0.19	0.50	87,100	1,710,000	0.11*	0.23*	0.92*
MIAMI FORT PLANT	3,298,400	1,656,000	0.044	0.17	0.64	1,013,400	3,309,000	0.047	0.45	1.06	104,000	3,744,000	0.049	0.44	1.67
MORRISON RIVER 1A	1,196,500	592,000	0.043	0.50	0.43	734,200	1,109,400	0.045	0.37	0.61	255,200	1,783,500	0.047	0.52	1.30
MORRISON RIVER 2	934,000	403,100	0.043	0.13	0.10	566,300	929,300	0.044	0.25	0.30	189,400	1,393,400	0.046	0.38	0.90
MORRISON RIVER PLT.	2,131,300	1,055,900	0.045	0.63	0.61	1,291,100	2,118,700	0.049	0.62	0.91	454,600	3,176,900	0.052	0.87	2.27

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western low Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
NILES 1	228,400	130,000	0.043	0.04	0.12	131,300	256,400	0.043	0.02	0.10	34,300	304,700	0.042	0.11	0.22
NILES 2	239,000	133,900	0.042	0.04	0.12	137,400	268,300	0.043	0.00	0.10	35,900	402,600	0.042	0.11	0.22
NILES PLANT	467,400	261,900	0.043	0.08	0.24	268,300	534,600	0.043	0.16	0.36	70,300	707,300	0.044	0.23	0.44
NORWALK 4	5,463	781	0.042	0.001	0.00	4,917	1,549	0.043	0.002	0.06	4,371	2,140	0.041	0.004	0.00
NORWALK 5	16,956	2,425	0.042	0.003	0.00	15,266	4,807	0.043	0.005	0.09	13,564	7,260	0.043	0.007	0.00
NORWALK PLANT	22,419	3,206	0.041	0.004	0.16	20,177	6,356	0.041	0.007	0.17	17,935	9,600	0.041	0.011	0.18
GREVILLE 1	59,000	26,600	0.03*	0.03*	0.06*	39,400	53,200	0.03*	0.03*	0.11*	19,700	79,000	0.04*	0.04*	0.17*
GREVILLE 2	59,000	26,600	0.03*	0.04*	0.06*	39,400	53,200	0.03*	0.04*	0.11*	19,700	79,000	0.04*	0.05*	0.17*
GREVILLE PLANT	118,000	53,200	0.03*	0.07*	0.12*	78,000	106,400	0.03*	0.07*	0.22*	39,400	159,000	0.04*	0.08*	0.34*

Table 4.8: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending: Western low Btu — Alternative 1: Coal required, tons: Existing	Alternative 1: Coal required, tons: Low sulfur	Alternative 1: Costs, $ MM: Blending	Alternative 1: Costs, $ MM: Boiler modification	Alternative 1: Costs, $ MM: ESP upgrade	Alternative 2: Coal required, tons: Existing	Alternative 2: Coal required, tons: Low sulfur	Alternative 2: Costs, $ MM: Blending	Alternative 2: Costs, $ MM: Boiler modification	Alternative 2: Costs, $ MM: ESP upgrade	Scrubbing: Coal required, tons: Existing	Scrubbing: Coal required, tons: Low sulfur	Scrubbing: Costs, $ MM: Blending	Scrubbing: Costs, $ MM: Boiler modification	Scrubbing: Costs, $ MM: ESP upgrade
PLEASANTVILLE 1	40,500	17,000	0.10*	0.03*	0.05*	36,400	49,000	0.11*	0.03*	0.10*	0,100	72,000	0.14*	0.03*	0.14*
PLEASANTVILLE PLANT	40,500	17,000	0.10*	0.03*	0.05*	36,000	49,000	0.11*	0.03*	0.10*	0,100	72,000	0.14*	0.03*	0.14*
FIELD 4	140,000	60,000	0.041	0.07	0.11	70,000	170,000	0.043	0.12	0.10	1,000	247,200	0.043	0.17	0.19
FIELD 5	140,000	60,000	0.011	0.07	0.11	70,000	170,000	0.043	0.12	0.10	1,000	247,200	0.043	0.17	0.19
FIELD 6	252,000	223,200	0.043	0.08	0.11	170,400	447,200	0.043	0.08	0.14	4,000	371,600	0.043	0.13	0.18
FIELD PLANT	533,200	440,000	0.041	0.19	0.33	330,000	883,200	0.043	0.32	0.53	7,000	1,200,000	0.043	0.46	0.56

Table 4.8: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending: Western low Btu — Alternative 1: Coal required, tons: Existing	Alternative 1: Coal required, tons: Low sulfur	Alternative 1: Costs, $ MM: Blending	Alternative 1: Costs, $ MM: Boiler modification	Alternative 1: Costs, $ MM: ESP upgrade	Alternative 2: Coal required, tons: Existing	Alternative 2: Coal required, tons: Low sulfur	Alternative 2: Costs, $ MM: Blending	Alternative 2: Costs, $ MM: Boiler modification	Alternative 2: Costs, $ MM: ESP upgrade	Scrubbing: Coal required, tons: Existing	Scrubbing: Coal required, tons: Low sulfur	Scrubbing: Costs, $ MM: Blending	Scrubbing: Costs, $ MM: Boiler modification	Scrubbing: Costs, $ MM: ESP upgrade
PICWAY 1	11,500	7,100	0.041	0.004	0.09	40,900	14,100	0.041	0.007	0.09	41,300	31,300	0.041	0.01	0.09
PICWAY 2	16,000	7,700	0.041	0.004	0.09	00,700	15,300	0.041	0.007	0.09	44,000	32,900	0.042	0.01	0.09
PICWAY 3	220,100	30,900	0.041	0.010	0.09	200,500	61,700	0.042	0.02	0.10	100,000	92,400	0.042	0.03	0.11
PICWAY PLANT	318,400	45,700	0.041	0.010	0.12	302,100	91,100	0.041	0.034	0.20	345,900	136,500	0.042	0.05	0.30
PIQUA 1	0,000	3,400	0.041	0.010		7,000	4,000	0.041	0.02		5,300	7,300	0.041	0.01	
PIQUA 2	2,100	000	0.011	0.007		1,700	1,300	0.041	0.01		1,300	1,000	0.041	0.02	
PIQUA 3	15,000	10,000	0.011	0.007	0.09	00,300	19,500	0.0'1	0.01	0.09	21,000	00,300	0.041	0.02	0.10
PIQUA 4	12,000	9,100	0.041	0.007	0.09	15,000	12,300	0.041	0.01	0.09	20,100	27,300	0.041	0.02	0.10
PIQUA 5	00,300	13,100	0.011	0.004	0.00	20,000	27,000	0.041	0.000	0.09	20,000	00,500	0.012	0.01	0.10
PIQUA PLANT	130,000	30,000	0.041	0.035	0.34	103,000	70,700	0.041	0.030	0.37	70,000	00,000	0.041	0.10	0.30

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal Blending — Western Low Btu — Alternative 1 — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade	Alternative 2 — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade	Resolution — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade
[illegible] 1	246,000	37,000	0.043	0.45	0.00	280,000	113,2[illegible]	0.043	0.43	0.09	106,200	176,700	0.043	0.03	0.30
[illegible] 2	283,000	69,300	0.043	0.08	0.08	244,700	177,0[illegible]	0.043	0.09	0.10	244,704	467,144	0.043	0.04	0.19
[illegible] PLANT	627,000	146,300	0.043	0.51	0.09	445,480	3,067	0.043	0.40	0.12	481,084	637,084	0.043	0.03	0.20
[illegible] 1	863,200	270,000	0.043	0.13	0.30	354,800	748,2[illegible]	0.044	0.23	0.49	9,000	1,118,1[illegible]	0.033	0.35	0.40
[illegible] 2	577,700	380,100	0.043	0.13	0.20	263,300	744,3[illegible]	0.044	0.23	0.49	2,600	1,143,3[illegible]	0.033	0.35	0.40
[illegible] 3	1,030,000	873,100	0.044	0.30	0.38	518,200	1,388,9[illegible]	0.047	0.46	0.60	16,700	2,038,7[illegible]	0.033	0.44	0.66
[illegible] 4	681,700	410,000	0.043	0.17	0.24	264,000	903,10[illegible]	0.043	0.38	0.32	11,100	1,381,0[illegible]	0.047	0.43	0.49
[illegible] PLANT	[illegible],078,000	1,874,7[illegible]	0.043	0.67	0.93	1,401,100	3,770,0[illegible]	0.048	1.20	2.90	46,000	8,640,9[illegible]	0.043	1.60	2.09

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal Blending — Western Low Btu — Alternative 1 — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade	Alternative 2 — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade	Resolution — Coal required, tons: Existing	Low sulfur	Capex, $ MM: Blending	Boiler modification	ESP upgrade
STUART 1	247,200	80,200	0.043	0.10	0.13	186,500	130,0[illegible]	0.043	0.13	0.13	121,000	246,044	0.043	0.27	0.32
STUART 2	233,300	73,700	0.043	0.10	0.13	174,400	100,0[illegible]	0.043	0.13	0.13	114,700	226,000	0.043	0.27	0.30
STUART 3	205,000	66,000	0.043	0.10	0.11	153,000	132,1[illegible]	0.043	0.13	0.13	100,000	250,100	0.043	0.27	0.32
STUART 4	141,700	46,000	0.043	0.10	0.11	100,000	91,0[illegible]	0.043	0.13	0.13	60,000	137,000	0.043	0.27	0.31
STUART PLANT	838,000	265,700	0.044	0.40	0.46	619,200	533,0[illegible]	0.044	0.78	0.50	405,400	725,10[illegible]	0.043	1.09	0.50
TAIT 3															
TAIT 4															
TAIT PLANT															
[illegible] 1	133,700	62,300	0.04	0.01	0.09	87,000	114,7[illegible]	0.04	0.00	0.11	N/A				
[illegible] 2	133,700	62,300	0.04	0.01	0.09	87,000	114,7[illegible]	0.04	0.00	0.11	N/A				
[illegible] 3	228,400	122,000	0.04	0.00	0.11	151,200	256,4[illegible]	0.04	0.00	0.15	N/A				
[illegible] PLANT	495,000	142,000	0.04	0.00	0.30	325,100	586,0[illegible]	0.04	0.13	0.30	N/A				

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending: Western low Btu — Alternative 1: Coal required, tons: Existing	Alternative 1: Coal required, tons: Low sulfur	Alternative 1: Costs, $ MM: Blending	Alternative 1: Costs, $ MM: Boiler modification	Alternative 1: Costs, $ MM: ESP upgrade	Alternative 2: Coal required, tons: Existing	Alternative 2: Coal required, tons: Low sulfur	Alternative 2: Costs, $ MM: Blending	Alternative 2: Costs, $ MM: Boiler modification	Alternative 2: Costs, $ MM: ESP upgrade	Regulation: Coal required, tons: Existing	Regulation: Coal required, tons: Low sulfur	Regulation: Costs, $ MM: Blending	Regulation: Costs, $ MM: Boiler modification	Regulation: Costs, $ MM: ESP upgrade
[illegible] 13	336,100	130,100	0.043	0.00	0.10	242,300	251,400	0.043	0.00	0.10	147,300	370,100	0.043	0.11	0.33
[illegible] PLANT	336,100	130,100	0.043	0.00	0.10	242,300	251,400	0.043	0.00	0.10	147,300	370,100	0.043	0.11	0.33
[illegible] 1															0.00
[illegible] 2															0.10
[illegible] PLANT															0.10

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Combination				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade
ANNE 4	182,000	56,467	0.042	0	0.00	89,057	111,700	0.042	0	0.20	20,005	166,000	0.042	0	0.33
ANNE 16	112,436	27,750	0.041	0	0.11	82,034	56,268	0.042	0	0.1	51,188	83,164	0.042	0	0.16
ANNE PLANT	264,534	83,222	0.042	0	0.11	171,091	167,048	0.042	0	0.31	88,179	220,072	0.042	0	0.40
ASHTABULA 5	362,716	130,250	0.043	0	0.10	269,000	277,212	0.042	0	0.22	57,232	414,947	0.042	0	0.25
ASHTABULA 4	441,099	167,966	0.042	0	0.12	254,964	336,707	0.042	0	0.14	69,688	504,162	0.042	0	0.30
ASHTABULA PLANT	800,611	386,216	0.042	0	0.31	464,030	614,009	0.042	0	0.27	136,907	919,129	0.042	0	0.55

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Combination				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade	Existing	Low sulfur	Blending	Boiler modification	EDF upgrade
AVON LAKE 5	190,000	50,742	0.042	0	0.10	126,952	117,402	0.042	0	0.12	62,097	176,224	0.042	0	0.14
AVON LAKE 6	163,999	50,476	0.042	0	0.10	109,007	100,950	0.042	0	0.12	54,210	151,425	0.042	0	0.14
AVON LAKE 7	219,000	110,601	0.042	0	0.13	186,056	220,302	0.042	0	0.20	56,747	358,082	0.043	0	0.20
AVON LAKE 8	1,000,015	427,219	0.042	0	0.25	624,007	854,437	0.044	0	0.20	160,101	1,201,485	0.045	0	0.28
AVON LAKE PLANT	1,750,666	656,120	0.042	0	0.50	1,047,502	1,311,202	0.046	0	0.72	334,253	1,967,366	0.047	0	0.76
BAYSHORE 1	251,511	74,224	0.042	0	0.00	175,200	140,240	0.042	0	0.12	99,051	222,371	0.042	0	0.19
BAYSHORE 2	263,350	77,730	0.042	0	0.00	183,536	150,231	0.042	0	0.12	103,717	232,740	0.042	0	0.20
BAYSHORE 3	260,317	76,233	0.042	0	0.00	180,933	152,366	0.042	0	0.12	101,731	230,306	0.042	0	0.20
BAYSHORE 4	487,266	140,474	0.042	0	0.00	368,183	270,367	0.042	0	0.15	120,050	410,525	0.042	0	0.32
BAYSHORE PLANT	1,180,302	368,661	0.042	0	0.00	804,022	734,136	0.042	0	0.51	425,267	1,101,022	0.042	0	1.00

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal blending Western High Sta. ALTERNATIVE 2 Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade	Coal blending Western High Sta. ALTERNATIVE 3 Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade	Coal blending Western High Sta. SCRUBBER Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade
[illegible] 1	137,067	44,790	0.042	0	0.11	75,011	60,989	0.042	0	0.10	83,196	139,030	0.042	0	0.24
[illegible] 2	130,067	48,990	01042	0	0.10	68,063	90,361	0.042	0	0.11	84,230	147,724	0.042	0	0.26
[illegible] 3	176,267	61,761	0.042	0	0.11	103,474	134,036	0.042	0	0.13	30,962	106,360	0.042	0	0.25
[illegible] 4	200,667	80,592	0.042	0	0.11	140,982	179,771	0.042	0	0.13	44,299	269,999	0.042	0	0.29
[illegible] 5	930,669	322,274	0.043	0	0.36	530,752	666,998	0.044	0	0.37	189,421	971,622	0.049	0	0.60
[illegible] PLANT	1,610,667	567,366	0.043	0	0.69	950,261	1,130,000	0.046	0	0.68	386,675	1,710,643	0.049	0	1.60
[illegible] 6	799,627	306,696	0.043	0	0.3*	450,525	699,762	0.043	0	0.30	114,637	913,000	0.044	0	1.00
[illegible] PLANT	799,627	306,696	0.043	0	0.30	450,525	699,762	0.043	0	0.30	114,637	913,000	0.044	0	1.00

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal blending Western High Sta. ALTERNATIVE 2 Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade	Coal blending Western High Sta. ALTERNATIVE 3 Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade	Coal blending Western High Sta. SCRUBBER Coal Required, tons Existing	Low sulfur	Blending	Capital $ MM Boiler modification	SCR upgrade
[illegible] 1	911,114	330,467	0.042	0	0.34	522,562	651,961	0.043	0	0.33	133,990	977,430	0.045	0	0.91
[illegible] 2	911,114	330,467	0.042	0	0.34	522,562	651,961	0.044	0	0.33	133,990	977,430	0.045	0	0.91
[illegible] PLANT	1,822,230	660,934	0.042	0	0.68	1,045,124	1,303,922	0.045	0	0.66	267,980	1,954,860	0.045	0	1.82
CLEVELAND 2	40,000	10,000	0.03*	0	0.00	20,000	30,200	0.03*	0	0.00	17,100	30,200	0.03*	0	0.00
CLEVELAND 3	40,000	10,000	0.03*	0	0.00	20,000	30,200	0.03*	0	0.00	17,440	30,200	0.03*	0	0.00
CLEVELAND 4	40,000	10,000	0.03*	0	0.00	20,000	30,200	0.03*	0	0.00	17,440	30,200	0.03*	0	0.00
CLEVELAND 5	40,000	10,000	0.03*	0	0.00	20,000	30,200	0.03*	0	0.00	17,440	30,200	0.03*	0	0.00
CLEVELAND 6	112,430	27,756	0.03*	0	0.11	62,034	90,260	0.04	0	0.11	51,160	83,104	0.04	0	0.10
CLEVELAND PLANT	272,430	67,756	0.03*	0	0.11	169,034	150,660	0.04*	0	0.11	120,940	203,904	0.04*	0	0.10
[illegible] 1	323,010	111,002	0.042	0	0.00	434,343	304,344	0.042	0	0.00	325,967	367,430	0.042	0	0.13
[illegible] 2	307,043	92,203	0.342	0	0.00	322,043	155,494	0.042	0	0.00	247,722	210,704	0.042	0	0.10
[illegible] 3	1,122,039	383,176	0.342	0	0.00	1,330,047	971,000	0.043	0	0.00	940,950	836,995	0.044	0	0.38
[illegible] 4	333,000	110,000	0.330*	0	0.00	300,000	225,000	0.030*	0	0.11	267,000	230,000	0.04*	0	0.12
[illegible] PLANT	2,067,000	676,741	0.040	0	0.*0	2,371,082	1,177,930	0.044	0	0.00	1,000,000	1,000,110	0.045	0	0.00

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu													
	ALTERNATIVE 3					ALTERNATIVE 4					SCRUBBING			
	Coal required, tons/hr		Costs, $ MM			Coal required, tons/hr		Costs, $ MM			Coal required, tons/hr		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
[illegible]	211,000	80,000	0.002	0	0.10	165,296	140,000	0.002	0	0.12	70,647	243,866	0.002	0	0.20
[illegible]	230,430	76,000	0.002	0	0.11	157,167	134,700	0.002	0	0.13	75,701	231,705	0.002	0	0.21
[illegible]	256,000	81,067	0.002	0	0.10	167,127	144,67[illegible]	0.002	0	0.12	80,520	246,560	0.002	0	0.20
[illegible]	322,571	110,967	0.002	0	0.00	201,012	270,06[illegible]	0.002	0	0.10	70,003	344,021	0.003	0	0.13
[illegible]	000,560	340,000	0.003	0	0.25	533,121	000,95[illegible]	0.004	0	0.42	103,491	1,000,000	0.005	0	0.00
[illegible] PLANT	1,050,100	704,270	0.003	0	0.00	2,013,063	1,000,110	0.005	0	0.00	440,021	2,112,710	0.007	0	1.04
[illegible] 1	04,302	33,004	0.002	0	0.10	50,194	67,[illegible]	0.002	0	0.10	12,003	101,700	0.002	0	0.21
[illegible] 2	200,000	62,101	0.002	0	0.10	133,076	125,000	0.002	0	0.11	67,001	187,200	0.002	0	0.13
[illegible] PLANT	204,304	05,005	0.003	0	0.20	102,070	101,04[illegible]	0.003	0	0.21	00,000	000,004	0.002	0	0.34
[illegible] 1	1,201,272	500,040	0.003	0	0.00	1,000,730	1,133,000	0.005	0	0.00	1,000,104	1,000,040	0.007	0	1.33
[illegible] PLANT	1,300,272	500,040	0.003	0	0.00	1,000,730	1,122,000	0.005	0	0.00	1,000,104	1,000,040	0.007	0	1.33
[illegible] 1	127,413	37,000	0.001	0	0.00	00,700	70,05[illegible]	0.001	0	0.11	50,104	110,113	0.002	0	0.11
[illegible] 2	131,300	30,200	0.001	0	0.00	00,402	72,03[illegible]	0.001	0	0.11	00,750	000,013	0.002	0	0.11
[illegible] PLANT	000,030	74,207	0.002	0	0.10	100,251	140,000	0.002	0	0.20	101,002	323,100	0.002	0	0.32

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending Western high Btu													
	ALTERNATIVE 3					ALTERNATIVE 4					SCRUBBING			
	Coal required, tons/hr		Costs, $ MM			Coal required, tons/hr		Costs, $ MM			Coal required, tons/hr		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
[illegible] CREEK 1	1,009,403	133,003	0.003	0	0.00	930,075	271,205	0.003	0	0.11	790,040	400,230	0.003	0	0.12
[illegible] CREEK 2	540,000	67,471	0.002	0	0.00	473,256	130,070	0.002	0	0.10	300,350	304,079	0.003	0	0.10
[illegible] CREEK 3	1,150,350	142,345	0.002	0	0.00	960,430	200,140	0.002	0	0.11	040,042	432,250	0.003	0	0.22
[illegible] CREEK PLANT	2,700,004	343,000	0.003	0	0.00	2,410,770	000,230	0.002	0	0.30	2,030,300	1,003,[illegible]	0.002	0	0.00
[illegible] 1	71,304	0,741	0.001	0	0.00	03,500	22,000	0.002	0	0.00	35,030	30,010	0.002	0	0.00
[illegible] 2	170,504	7,021	0.001	0	0.00	00,003	25,210	0.002	0	0.00	30,503	42,724	0.002	0	0.00
[illegible] 3	134,300	14,029	0.001	0	0.00	00,017	40,074	0.003	0	0.00	03,104	70,724	0.003	0	0.00
[illegible] 4	134,300	14,027	0.001	0	0.00	00,017	40,074	0.001	0	0.00	03,104	70,230	0.002	0	0.00
[illegible] 5	430,374	00,472	0.002	0	0.11	272,434	230,001	0.003	0	0.23	105,014	201,720	0.003	0	0.30
[illegible] PLANT	007,022	133,000	0.002	0	0.03	003,000	001,000	0.003	0	0.03	300,003	031,010	0.002	0	0.72

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Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
MIAMI FORT 3	366,500	183,130	0.043	0	0.11	190,311	206,341	0.043	0	0.10	33,035	300,547	0.043	0	0.33
MIAMI FORT 4	1,324,227	512,304	0.043	0	0.11	746,146	1,624,961	0.045	0	0.16	168,869	1,537,610	0.045	0	0.30
MIAMI FORT 5	851,000	304,000	0.00	0	0.24	402,000	773,000	0.00	0	0.33	72,000	665,000	0.11*	0	0.91
MIAMI FORT PLANT	2,441,815	1,061,470	0.043	0	0.46	1,290,357	2,604,300	0.046	0	0.64	274,904	2,512,165	0.046	0	1.00
MUSKINGUM RIVER 1A	1,218,330	374,466	0.043	0	0.00	768,630	751,412	0.044	0	0.61	330,906	1,130,744	0.048	0	0.61
MUSKINGUM RIVER 2	951,046	292,550	0.042	0	0.00	609,509	587,053	0.043	0	0.10	256,713	800,354	0.044	0	0.30
MUSKINGUM RIVER PLT.	2,170,104	667,034	0.043	0	0.00	1,300,140	1,330,465	0.04[illegible]	0	0.79	571,610	2,086,[illegible]	0.048	0	0.97

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
HYLES 1	336,813	77,413	0.042	0	0.10	148,225	155,068	0.043	0	0.11	50,630	322,732	0.043	0	0.22
HYLES 2	247,791	81,063	0.042	0	0.10	155,096	162,756	0.043	0	0.13	62,483	343,510	0.042	0	0.22
HYLES PLANT	484,604	158,415	0.043	0	0.30	303,321	317,324	0.043	0	0.23	122,641	476,232	0.043	0	0.44
NORMALE 4	5,519	486	0.041	0	0.00	5,007	960	0.041	0	0.00	4,483	1,452	0.041	0	0.00
NORMALE 5	17,173	1,516	0.041	0	0.00	15,500	3,000	0.041	0	0.00	13,930	4,513	0.042	0	0.00
NORMALE PLANT	22,692	2,004	0.041	0	0.00	20,507	3,977	0.041	0	0.16	18,423	5,965	0.042	0	0.16
GREVILLE 1	68,300	16,600	0.03*	0	0.06*	41,700	33,300	0.03*	0	0.11*	23,100	49,000	0.04*	0	0.17*
GREVILLE 2	68,300	16,600	0.03*	0	0.06*	41,700	33,300	0.03*	0	0.11*	23,100	49,000	0.04*	0	0.17*
GREVILLE PLANT	120,000	33,200	0.33*	0	0.12*	83,400	66,600	0.03*	0	0.22*	46,200	99,000	0.04*	0	0.36*

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GOOD POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Alternative 3				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PAINESVILLE 1	46,700	14,500	0.10*	0	0.05*	30,200	29,000	0.11*	0	0.10*	14,100	43,500	0.14*	0	0.14*
PAINESVILLE PLANT	46,700	14,500	0.10*	0	0.05*	30,200	29,000	0.11*	0	0.10*	14,100	43,500	0.14*	0	0.14*
PHILO 4	144,972	54,852	0.041	0	0.09	80,704	109,604	0.041	0	0.08	16,440	164,512	0.042	0	0.10
PHILO 5	144,972	54,852	0.041	0	0.09	80,704	109,604	0.041	0	0.11	16,440	164,512	0.042	0	0.10
PHILO 6	364,140	137,700	0.041	0	0.09	202,716	275,500	0.041	0	0.11	41,296	413,220	0.043	0	0.10
PHILO PLANT	654,092	247,404	0.041	0	0.30	364,124	494,876	0.041	0	0.[illegible]	74,176	742,252	0.042	0	0.06

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GOOD POWER PLANTS

Plant Identification	Coal blending, Western high Btu														
	Alternative 1					Alternative 2					Alternative 3				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PICHAY 1	52,770	4,474	0.041	0	0.00	47,452	8,896	0.041	0	0.00	42,127	13,317	0.041	0	0.00
PICHAY 2	57,087	4,839	0.041	0	0.00	51,326	9,622	0.041	0	0.00	45,567	14,404	0.041	0	0.00
PICHAY 3	230,215	19,515	0.041	0	0.00	206,903	38,804	0.042	0	0.00	183,756	58,000	0.042	0	0.00
PICHAY PLANT	340,080	28,828	0.041	0	0.00	305,761	57,322	0.042	0	0.00	271,450	85,809	0.042	0	0.00
PIQUA 1	8,787	1,418	0.041	0	0.00	7,317	2,831	0.041	0	0.00	5,846	4,247	0.041	0	0.00
PIQUA 2	2,170	340	0.041	0	0.00	1,887	600	0.041	0	0.00	1,443	1,049	0.041	0	0.00
PIQUA 3	38,727	5,753	0.041	0	0.00	29,750	11,510	0.041	0	0.00	23,760	17,266	0.042	0	0.00
PIQUA 4	33,340	5,363	0.041	0	0.00	27,762	10,741	0.041	0	0.00	22,181	16,114	0.041	0	0.00
PIQUA 5	49,350	7,940	0.041	0	0.00	41,102	15,983	0.041	0	0.00	32,830	23,857	0.041	0	0.00
PIQUA PLANT	120,596	19,419	0.041	0	0.24	107,738	41,684	0.041	0	0.24	86,078	62,535	0.042	0	0.26

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Western high Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PONTON 1	248,828	34,170	0.041	0	0.09	389,107	67,976	0.042	0	0.09	168,855	182,375	0.042	0	0.11
PONTON 2	389,561	53,496	0.042	0	0.00	327,503	106,422	0.042	0	0.09	264,357	160,277	0.042	0	0.11
PONTON PLANT	638,389	87,666	0.042	0	0.09	536,690	174,398	0.042	0	0.18	433,212	262,652	0.042	0	0.22
SAMMIS 1	592,693	219,176	0.042	0	0.19	345,153	440,024	0.043	0	0.19	99,972	658,773	0.043	0	0.40
SAMMIS 2	607,961	224,816	0.042	0	0.19	354,844	451,359	0.043	0	0.20	102,547	675,744	0.043	0	0.40
SAMMIS 3	1,080,634	399,604	0.043	0	0.27	629,304	802,279	0.045	0	0.28	182,275	1,201,115	0.045	0	0.66
SAMMIS 4	717,416	265,291	0.042	0	0.23	417,785	532,620	0.043	0	0.24	121,010	797,482	0.045	0	0.62
SAMMIS PLANT	2,998,704	1,109,887	0.045	0	0.88	1,746,286	2,226,200	0.049	0	0.91	505,804	3,332,024	0.053	0	2.88

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Western high Btu														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
STUART 1	257,045	44,908	0.042	0	0.00	294,357	89,222	0.042	0	0.00	150,444	134,566	0.042	0	0.10
STUART 2	242,518	42,370	0.042	0	0.00	192,808	84,180	0.042	0	0.00	141,942	126,961	0.042	0	0.10
STUART 3	213,984	37,385	0.042	0	0.00	170,123	74,276	0.042	0	0.00	125,242	112,023	0.042	0	0.10
STUART 4	147,352	2[illegible],744	0.042	0	0.00	117,148	51,147	0.042	0	0.00	86,243	77,140	0.042	0	0.10
STUART PLANT	860,899	150,407	0.042	0	0.00	684,436	298,825	0.042	0	0.00	503,871	450,690	0.042	0	0.40
TAIT 3															
TAIT 4															
TAIT PLANT															
TIDD 1	137,413	37,958	0.04	0	0.09	94,759	76,055	0.04	0	0.11	52,104	114,153	0.04	0	0.11
TIDD 2	137,413	37,958	0.04	0	0.09	94,759	76,055	0.04	0	0.11	52,104	114,153	0.04	0	0.11
TIDD 3	236,013	77,413	0.04	0	0.09	148,225	155,868	0.04	0	0.11	59,638	233,722	0.04	0	0.12
TIDD PLANT	511,639	153,329	0.04	0	0.27	337,743	307,178	0.04	0	0.33	163,846	461,028	0.04	0	0.40

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant Identification	Coal blending														
	Western high Sta														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
TORONTO 12	244,454	76,289	0.047	0	0.13	259,198	151,682	0.042	0	0.16	172,938	227,082	0.042	0	0.17
TORONTO PLANT	244,454	76,289	0.042	0	0.13	259,198	151,682	0.042	0	0.16	172,938	227,082	0.042	0	0.17
WOODCOCK 1				0											0.09
WOODCOCK 2				0											0.09
WOODCOCK PLANT				0											0.18

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
ACME 4	133,000	71,572	0.042	0	0.08	52,320	143,414	0.042	0	0.19					
ACME 14	183,960	35,081	0.042	0	0.10	63,049	71,205	0.042	0	0.11	22,583	107,316	0.042	0	0.10
ACME PLANT	335,500	106,373	0.042	0	0.10	115,369	214,699	0.042	0	0.30	22,583	107,316			
ASTRADULA 5	328,777	160,066	0.042	0	0.11	135,934	330,473	0.042	0	0.14					
ASTRADULA 4	396,074	205,200	0.042	0	0.10	168,067	411,341	0.042	0	0.24					
ASTRADULA PLANT	723,751	374,066	0.042	0	0.29	301,001	749,774	0.042	0	0.38					

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
AVON LAKE 5	176,756	79,321	0.042	0	0.10	98,058	141,033	0.042	0	0.13	30,560	211,947	0.042	0	0.14
AVON LAKE 6	151,082	6[illegible],507	0.042	0	0.10	84,946	121,107	0.042	0	0.13	18,011	161,777	0.042	0	0.14
AVON LAKE 7	207,923	143,093	0.042	0	0.11	130,240	266,104	0.042	0	0.13					
AVON LAKE 8	906,048	412,065	0.042	0	0.24	420,271	1,025,713	0.044	0	0.30					
AVON LAKE PLANT	1,603,400	707,075	0.041	0	0.55	734,315	1,574,113	0.046	0	0.60	30,071	303,324	0.042	0	1.41
RAVENSWOOD 1	264,047	60,405	0.042	0	0.00	201,347	120,969	0.042	0	0.11					
RAVENSWOOD 2	270,840	63,333	0.042	0	0.00	210,030	126,667	0.042	0	0.11					
RAVENSWOOD 3	385,362	63,131	0.042	0	0.00	306,705	126,263	0.042	0	0.12					
RAVENSWOOD 4	432,997	113,583	0.042	0	0.00	314,127	227,166	0.042	0	0.15					
RAVENSWOOD PLANT	1,333,546	299,522	0.043	0	0.00	933,000	599,048	0.043	0	0.49					

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal Blending														
	Existing					Existing					Existing				
	Alternative 3					Alternative 4					Alternative 5				
	Coal required, tons		Change, $ MM			Coal required, tons		Change, $ MM			Coal required, tons		Change, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
CLEVELAND 1	113,224	66,372	0.002	0	0.11	48,110	13,703	0.003	0	0.13					
CLEVELAND 2	123,068	61,671	0.002	0	0.10	58,050	23,302	0.002	0	0.11					
CLEVELAND 3	156,180	77,762	0.002	0	0.10	63,014	30,524	0.002	0	0.12					
CLEVELAND 4	220,389	1,137,13[illegible]	0.002	0	0.11	93,386	39,436	0.003	0	0.13					
CLEVELAND 5	614,728	340,632	0.003	0	0.30	231,030	81,361	0.005	0	0.26					
CLEVELAND PLANT	1,430,304	1,730,547	0.007	0	0.62	504,213	1,488,394	0.017	0	0.04					
GREENVILLE 4	707,958	343,931	0.003	0	0.27	313,689	787,042	0.003	0	0.31					
GREENVILLE PLANT	707,958	343,931	0.003	0	0.27	313,689	787,042	0.003	0	0.31					

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL FIRED PLANTS

Plant Identification	Coal Blending														
	Existing					Existing					Existing				
	Alternative 3					Alternative 4					Alternative 5				
	Coal required, tons		Change, $ MM			Coal required, tons		Change, $ MM			Coal required, tons		Change, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
GREENVILLE 1	889,524	491,010	0.003	0	0.33	390,168	983,630	0.004	0	0.38					
GREENVILLE 2	889,524	491,010	0.003	0	0.33	390,168	983,630	0.004	0	0.38					
GREENVILLE PLANT	1,681,048	983,020	0.004	0	0.66	780,336	1,967,260	0.004	0	0.00					
CLEVELAND 2	37,000	18,000	0.03*	0	0.00	31,000	20,100	0.03*	0	0.00	6,100	30,300	0.03*	0	0.00
CLEVELAND 3	37,000	18,00	0.03*	0	0.00	31,000	20,100	0.03*	0	0.00	6,100	30,300	0.03*	0	0.00
CLEVELAND 4	37,000	18,000	0.03*	0	0.00	31,000	20,100	0.03*	0	0.00	6,100	30,300	0.03*	0	0.00
CLEVELAND 5	37,000	18,000	0.03*	0	0.00	31,000	20,100	0.03*	0	0.00	6,100	30,300	0.03*	0	0.00
CLEVELAND 6	162,700	30,001	0.04	0	0.10	63,000	71,300	0.04	0	0.11	28,000	107,210	0.04	0	0.20
CLEVELAND PLANT	313,300	96,001	0.03*	0	0.00	90,000	170,000	0.04*	0	0.07	47,200	204,110	0.04*	0	0.30
GREENVILLE 1	500,913	32,670	0.003	0	0.00	307,140	333,501	0.003	0	0.00	207,304	314,440	0.003	0	0.31
GREENVILLE 2	305,709	60,993	0.003	0	0.00	302,100	170,100	0.003	0	0.00	210,670	230,201	0.003	0	0.00
GREENVILLE 3	1,070,101	300,350	0.003	0	0.00	1,100,500	101,011	0.003	0	0.00	630,000	715,072	0.004	0	0.00
GREENVILLE 4	500,000	30,000	0.030*	0	0.00	303,000	341,000	0.030*	0	0.11	317,000	300,000	0.04*	0	0.12
GREENVILLE PLANT	2,077,703	730,004	0.044	0	0.00	1,900,004	1,200,077	0.044	0	0.11	1,000,000	1,011,300			0.00

Table 4.3: Section 4. [illegible]

Plant Identification	Coal blending: Allocation A: Unit required, tons: Existing	Allocation A: Unit required, tons: Low sulfur	Allocation A: Change, $ MM: Blending	Allocation A: Change, $ MM: Boiler modification	Allocation A: Change, $ MM: SCR upgrade	Allocation B: Unit required, tons: Existing	Allocation B: Unit required, tons: Low sulfur	Allocation B: Change, $ MM: Blending	Allocation B: Change, $ MM: Boiler modification	Allocation B: Change, $ MM: SCR upgrade	Scrubber: Unit required, tons: Existing	Scrubber: Unit required, tons: Low sulfur	Scrubber: Change, $ MM: Blending	Scrubber: Change, $ MM: Boiler modification	Scrubber: Change, $ MM: SCR upgrade
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.10					
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00					
[illegible]	[illegible]	[illegible]	0.042	0	0.03	[illegible]	[illegible]	0.042	0	0.04	[illegible]	[illegible]	-	-	-
[illegible]	[illegible]	[illegible]	0.042	0	0.10	[illegible]	[illegible]	0.042	0	0.10				-	-
[illegible]	[illegible]	[illegible]	0.042	0	0.10	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.12
[illegible]	[illegible]	[illegible]	0.042	0	0.10	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]		-	
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	1.20
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	1.32
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.12
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.12
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00

Table 4.3: Section 4. [illegible]

Plant Identification	Coal blending: Allocation A: Unit required, tons: Existing	Allocation A: Unit required, tons: Low sulfur	Allocation A: Change, $ MM: Blending	Allocation A: Change, $ MM: Boiler modification	Allocation A: Change, $ MM: SCR upgrade	Allocation B: Unit required, tons: Existing	Allocation B: Unit required, tons: Low sulfur	Allocation B: Change, $ MM: Blending	Allocation B: Change, $ MM: Boiler modification	Allocation B: Change, $ MM: SCR upgrade	Scrubber: Unit required, tons: Existing	Scrubber: Unit required, tons: Low sulfur	Scrubber: Change, $ MM: Blending	Scrubber: Change, $ MM: Boiler modification	Scrubber: Change, $ MM: SCR upgrade
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.12
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.12	[illegible]	[illegible]	0.042	0	0.13
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.15	[illegible]	[illegible]	0.042	0	0.22
[illegible]	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.20	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.041	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.041	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.041	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.041	0	0.00	[illegible]	[illegible]	0.042	0	0.00	[illegible]	[illegible]	0.042	0	0.00
[illegible]	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.12					
[illegible]	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]	0.042	0	0.11	[illegible]	[illegible]		-	

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Emulsion				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
MIAMI PORT 3	245 328	120,037	0.042	0	0.11	107,670	240,156	0.042	0	0.15					
MIAMI PORT 4	1,210,622	596,262	0.043	0	0.11	534,070	1,192,9[illegible]1	0.044	0	0.16					
MIAMI PORT 5	752,000	465,000	0.09	0	0.23	205,000	979,000	0.09	0	0.33	N/A				
MIAMI PORT PLANT	2,215,950	1,460,2[illegible]9	0.043	0	0.45	877,540	2,362,[illegible]7	0.045	0	0.64					
MISSISSIPPI RIVER 1A	1,174,948	484,262	0.043	0	0.00	681,560	811,203	0.044	0	0.42	190,350	1,216,35[illegible]	0.045	0	0.60
MISSISSIPPI RIVER 2	917,947	315,037	0.042	0	0.00	532,400	633,766	0.043	0	0.18	148,714	950,3[illegible]	0.044	0	0.30
MISSISSIPPI RIVER PLT.	2,092,895	720,100	0.044	0	0.00	1,214,054	1,444,9[illegible]0	0.046	0	0.60	330,064	2,166,65[illegible]	0.040	0	0.90

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED GRID POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Emulsion				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
NILES 1	219,252	91,332	0.042	0	0.10	113,6[illegible]0	182,93[illegible]	0.042	0	0.13	6,047	274,534	0.056	0	0.22
NILES 2	229,416	95,555	0.042	0	0.10	110,291	191,400	0.042	0	0.13	7,164	307,260	0.042	0	0.24
NILES PLANT	448,660	906,977	0.042	0	0.20	231,341	374,333	0.043	0	0.24	14,011	361,794	0.057	0	0.47
NORWALK 4	3,072	341	0.041	0	0.00	3,449	775	0.041	0	0.00	3,017	1,167	0.041	0	0.00
NORWALK 5	17,457	1,762	0.041	0	0.00	15,550	3,400	0.042	0	0.00	12,601	5,572	0.042	0	0.00
NORWALK PLANT	21,329	2,1[illegible]	0.042	0	0.16	18,999	4,269	0.042	0	0.16	17,410	6,740	0.042	0	0.16
GRENVILLE 1	58,000	18,300	0.03*	0	0.06*	37,100	26,600	0.03*	0	0.11*	16,400	55,000	0.04*	0	0.17*
GRENVILLE 2	58,000	18,300	0.03*	0	0.06*	37,100	26,600	0.03*	0	0.11*	16,400	55,000	0.04*	0	0.17*
GRENVILLE PLANT	110,000	36,600	0.03*	0	0.12*	74,200	73,200	0.03*	0	0.22*	32,800	110,000	0.04*	0	0.34*

Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Western														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PLEASANTVILLE 1	42,400	17,900	0.10*	0	0.05*	31,900	38,900	0.11*	0	0.10*	1,000	52,000	0.14*	0	0.14*
PLEASANTVILLE PLANT	42,400	17,900	0.10*	0	0.05*	31,900	38,900	0.11*	0	0.10*	1,000	52,000	0.14*	0	0.14*
PHILO 4	134,720	62,500	0.041	0	0.00	60,212	135,132	0.042	0	0.11					
PHILO 5	134,720	62,500	0.041	0	0.00	60,212	135,132	0.042	0	0.11					
PHILO 6	330,396	157,192	0.041	0	0.00	151,240	314,312	0.042	0	0.11					
PHILO PLANT	607,836	282,392	0.042	0	0.00	271,664	564,576	0.042	0	0.23					

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PICWAY 1	52,213	4,864	0.041	0	0.00	48,273	9,710	0.041	0	0.00	40,331	14,571	0.041	0	0.00
PICWAY 2	56,476	5,261	0.041	0	0.00	58,050	10,511	0.041	0	0.00	43,634	15,762	0.041	0	0.00
PICWAY 3	227,761	21,217	0.041	0	0.00	201,838	42,380	0.042	0	0.10	175,922	63,550	0.041	0	0.11
PICWAY PLANT	336,440	31,342	0.042	0	0.10	29,050	62,610	0.042	0	0.20	259,877	93,890	0.042	0	0.20
PIQUA 1	8,306	1,763	0.041	0	0.00	6,534	3,527	0.042	0	0.00	4,672	5,291	0.041	0	0.00
PIQUA 2	2,073	438	0.041	0	0.00	1,613	871	0.041	0	0.00	1,194	1,308	0.041	0	0.00
PIQUA 3	34,137	7,240	0.041	0	0.00	26,566	14,340	0.041	0	0.00	19,000	21,512	0.041	0	0.00
PIQUA 4	31,856	6,609	0.041	0	0.00	24,793	13,303	0.041	0	0.00	17,730	20,075	0.041	0	0.00
PIQUA 5	47,163	9,983	0.041	0	0.00	36,703	19,912	0.042	0	0.00	36,280	29,731	0.041	0	0.00
PIQUA PLANT	123,625	26,030	0.042	0	0.24	96,200	51,932	0.042	0	0.24	68,607	77,905	0.042	0	0.27

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Table 4.2: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
PROTON 1	240,030	41,000	0.041	0	0.00	151,700	81,565	0.043	0	0.00	142,517	132,040	0.043	0	0.11
PROTON 2	270,000	64,100	0.043	0	0.00	300,133	137,607	0.043	0	0.00	223,122	193,316	0.043	0	0.11
PROTON PLANT	615,030	109,100	0.043	0	0.00	401,833	209,263	0.043	0	0.10	365,630	315,106	0.043	0	0.22
SAMMIS 1	520,440	272,065	0.043	0	0.10	215,030	547,223	0.043	0	0.10					
SAMMIS 2	542,061	279,074	0.043	0	0.10	330,567	571,330	0.043	0	0.10					
SAMMIS 3	962,400	496,040	0.043	0	0.27	305,032	907,730	0.043	0	0.30					
SAMMIS 4	630,000	320,317	0.043	0	0.22	260,277	663,370	0.044	0	0.23					
SAMMIS PLANT	2,673,000	1,370,500	0.047	0	0.00	1,000,934	2,960,631	0.053	0	0.00					

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED COAL POWER PLANTS

Plant Identification	Coal blending														
	Eastern														
	Alternative 1					Alternative 2					Regulation				
	Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM			Coal required, tons		Costs, $ MM		
	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade	Existing	Low sulfur	Blending	Boiler modification	ESP upgrade
STUART 1	234,401	63,400	0.043	0	0.00	180,944	124,550	0.106	0	0.00	83,450	187,000	0.043	0	0.10
STUART 2	251,427	90,147	0.043	0	0.00	150,905	117,511	0.043	0	0.00	70,742	177,333	0.043	0	0.10
STUART 3	134,537	38,932	0.043	0	0.00	91,000	71,300	0.043	0	0.00	47,043	107,000	0.043	0	0.10
STUART 4	98,644	24,747	0.043	0	0.00	63,137	49,166	0.043	0	0.00	33,940	74,152	0.043	0	0.10
STUART PLANT	904,736	182,510	0.043	0	0.00	460,674	362,500	0.043	0	0.00	242,900	546,500	0.043	0	0.40
TAIT 3															
TAIT 4															
TAIT PLANT															
TIDD 1	120,025	44,010	0.04	0	0.00	70,000	88,300	0.04	0	0.11	N/A				
TIDD 2	120,025	44,010	0.34	0	0.00	70,000	88,300	0.04	0	0.11	N/A				
TIDD 3	210,253	91,322	0.34	0	0.00	113,000	182,900	0.04	0	0.11	N/A				
TIDD PLANT	470,902	170,300	0.34	0	0.10	272,102	380,300	0.04	0	0.33	N/A				

Table 4.3: Section 4. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal blending: Alternative 1: Coal required, tons: Existing	Coal blending: Alternative 1: Coal required, tons: Low sulfur	Coal blending: Alternative 1: Costs, $ MM: Blending	Coal blending: Alternative 1: Costs, $ MM: Boiler modification	Coal blending: Alternative 1: Costs, $ MM: FGD upgrade	Coal blending: Alternative 2: Coal required, tons: Existing	Coal blending: Alternative 2: Coal required, tons: Low sulfur	Coal blending: Alternative 2: Costs, $ MM: Blending	Coal blending: Alternative 2: Costs, $ MM: Boiler modification	Coal blending: Alternative 2: Costs, $ MM: FGD upgrade	Scrubber: Coal required, tons: Existing	Scrubber: Coal required, tons: Low sulfur	Scrubber: Costs, $ MM: Blending	Scrubber: Costs, $ MM: Boiler modification	Scrubber: Costs, $ MM: FGD upgrade
[illegible] 12	226,666	90,666	0.062	0	0.13	223,449	100,204	0.062	0	0.16	110,990	271,173	0.062	0	0.10
[illegible] PLANT	226,666	90,666	0.062	0	0.13	223,449	100,204	0.062	0	0.16	110,990	271,173	0.062	0	0.10
[illegible] 1															0.00
[illegible] 2															0.00
[illegible] PLANT															0.10

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
ACME 4	3.3	26 TPH coal cleaning not feasible		2.3	0.6	108.0
ACME 16	3.3	0.0	0.0	2.3	1.4	108.0
ACME PLANT	3.3	1.4	12.2	2.3	2.0	108.0
ASHTABULA 5	3.1	0.8	8.8	2.4	1.4	77.5
ASHTABULA 4	3.1	1.2	8.8	2.4	2.1	77.5
ASHTABULA PLT.	3.1	2.0	8.8	2.4	3.5	77.5

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
AVON LAKE 5	3.7	Plant has more	than 3 stacks	2.6	0.0	0.0
AVON LAKE 6	3.7	0.0	0.0	2.6	0.0	0.0
AVON LAKE 7	3.7	0.0	0.0	2.6	0.0	0.0
AVON LAKE 8	3.7	0.0	0.0	2.6	0.0	0.0
AVON LAKE PLT.	3.7	3.6	10.6	2.6	7.1	92.9
BAYSHORE 1	2.6	Plant has more	than 3 stacks	2.0	0.0	0.0
BAYSHORE 2	2.6	0.0	0.0	2.0	0.0	0.0
BAYSHORE 3	2.6	0.0	0.0	2.0	0.0	0.0
BAYSHORE 4	2.6	0.0	0.0	2.0	0.0	0.0
BAYSHORE PLT.	2.6	1.8	7.3	2.0	3.0	64.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
BECKJORD 1	3.4	Plant has more	than 3 stacks	2.6	0.0	0.0
BECKJORD 2	3.4	0.0	0.0	2.6	0.0	0.0
BECKJORD 3	3.4	0.0	0.0	2.6	0.0	0.0
BECKJORD 4	3.4	0.0	0.0	2.6	0.0	0.0
BECKJORD 5	3.4	0.0	0.0	2.6	0.0	0.0
BECKJORD PLT.	3.4	2.5	8.8	2.6	4.7	76.7
BURGER 6	3.7	2.4	10.0	2.6	4.4	88.5
BURGER PLT.	3.7	2.4	10.0	2.6	4.4	88.5

Table 4-2: Section 3. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
CARDINAL 1	2.4	1.6	11.6	3.3	3.2	103.0
CARDINAL 2	2.4	1.6	11.6	3.3	3.2	103.0
CARDINAL PLT.	2.4	3.2	11.6	3.3	6.4	103.0
CLEVELAND 2			Plant has more than 3 stacks			
CLEVELAND 3			Plant has more than 3 stacks			
CLEVELAND 4			Plant has more than 3 stacks			
CLEVELAND 5			Plant has more than 3 stacks			
CLEVELAND 6			Plant has more than 3 stacks			
CLEVELAND PLANT	2.4	1.4	12.4	1.4	2.1	108.0
CONESVILLE 1	6.2	0.8	12.4	4.1	1.6	108.0
CONESVILLE 2	6.2	0.4	12.4	4.1	0.8	108.0
CONESVILLE 3	6.2	2.6	12.4	4.1	5.2	108.0
CONESVILLE 4	6.2	1.2	12.4	4.1	2.4	108.0
CONESVILLE PLT.	6.2	3.8	12.4	4.1	7.6	108.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
EAST LAKE 1	3.2	Plant has more than 3 stacks		2.4	0.0	0.0
EAST LAKE 2	3.2	0.0	0.0	2.4	0.0	0.0
EAST LAKE 3	3.2	0.0	0.0	2.4	0.0	0.0
EAST LAKE 4	3.2	0.0	0.0	2.4	0.0	0.0
EAST LAKE 5	3.2	0.0	0.0	2.4	0.0	0.0
EAST LAKE PLT.	3.2	3.5	9.4	2.4	7.0	82.7
EDGEWATER 1	3.3	27 TPH coal cleaning not feasible		2.3	0.7	73.5
EDGEWATER 2	3.3	0.0	0.0	2.3	0.8	73.5
EDGEWATER PLT.	3.3	1.2	8.5	2.3	1.5	73.5
GAVIN 1	3.4	2.5	5.8	2.5	4.6	49.4
GAVIN PLT.	3.4	2.5	5.8	2.5	4.6	49.4
GORGE 1	4.0	0.0	0.0	2.8	0.0	0.0
GORGE 2	4.0	0.0	0.0	2.8	0.0	0.0
GORGE PLT.	4.0	1.18	12.5	2.8	1.44	108.0

Table 4-2; Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
KYGER CREEK 1	5.0	1.8	10.4	3.1	3.4	90.6
KYGER CREEK 2	5.0	0.9	10.4	3.1	1.7	90.6
KYGER CREEK 3	5.0	1.8	10.4	3.1	3.5	90.6
KYGER CREEK PLT.	5.0	4.5	10.4	3.1	8.6	90.6
LAKESHORE 1	2.7	Plant has more than 3 stacks		2.0	0.0	0.0
LAKESHORE 2	2.7	0.0	0.0	2.0	0.0	0.0
LAKESHORE 3	2.7	0.0	0.0	2.0	0.0	0.0
LAKESHORE 4	2.7	0.0	0.0	2.0	0.0	0.0
LAKESHORE 5	2.7	0.0	0.0	2.0	0.0	0.0
LAKESHORE PLT.	2.7	1.7	7.2	2.0	3.0	63.9

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
MIAMI FORT 3	3.9	[illegible]	12.0	3.1	1.5	108.0
MIAMI FORT 4	3.9	0.8	12.0	3.1	1.4	108.0
MIAMI FORT 5	3.9	1.7	12.0	3.1	2.9	108.0
MIAMI FORT PLT.	3.9	3.4	12.0	3.1	5.8	108.0
MUSKINGUM R. 1A	6.2	2.9	13.0	3.8	5.9	108.0
MUSKINGUM R. 2	6.2	2.0	13.0	3.8	3.9	108.0
MUSKINGUM PLT.	6.2	4.9	13.0	3.8	9.8	108.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
WILES 1	3.7	0.7	4.7	2.5	1.1	83.4
WILES 2	3.7	0.8	4.9	2.5	1.1	83.4
WILES PLT.	3.7	1.5	9.6	2.5	2.2	83.4
NORWALK 4	4.0	0.0	0.0	2.8	0.0	0.0
NORWALK 5	4.0	0.0	0.0	2.8	0.0	0.0
NORWALK PLT.	4.0	Plant too small for coal cleaning		2.8		
ORRVILLE 1		50 TPH coal cleaning not feasible				
ORRVILLE 2		50 TPH coal cleaning not feasible				
ORRVILLE PLT.	6.0	0.9	12.5	4.8	1.2	168.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
PAINESVILLE 1		50 TPH coal cleaning not feasible				
PAINESVILLE PLT.		50 TPH coal cleaning not feasible				
PHILO 4	4.0	0.0	0.0	2.8	1.1	108.0
PHILO 5	4.0	0.0	0.0	2.8	1.1	108.0
PHILO 6	4.0	41 TPH coal cleaning not feasible		2.8	0.7	108.0
PHILO PLANT	4.0	1.7	12.3	2.8	2.9	108.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
PICWAY 1	6.4	11 TPH Coal cleaning not feasible		4.4	26 TPH coal cleaning not feasible	
PICWAY 2	6.4	0.0	0.0	4.4	0.0	0.0
PICWAY 3	6.4	0.0	0.0	4.4	0.0	0.0
PICWAY PLANT	6.4	1.2	12.2	4.4	1.8	108.6
PIQUA 1	2.7	Plant has more than three stacks		2.0	0.0	0.0
PIQUA 2	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 3	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 4	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA 5	2.7	0.0	0.0	2.0	0.0	0.0
PIQUA PLANT	2.7	Plant too small for coal cleaning		2.0	0.0	0.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
POSTON 1	3.4	39 TPH coal	cleaning not feasible	2.5	0.9	108.0
POSTON 2	3.4	0.0	0.0	2.5	1.2	108.0
POSTON PLANT	3.4	14.0	12.4	2.5	2.1	108.0
SAMMIS 1	3.1	Plant has more than 3 stacks		2.2	0.0	0.0
SAMMIS 2	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS 3	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS 4	3.1	0.0	0.0	2.2	0.0	0.0
SAMMIS PLANT	3.1	6.0	9.9	2.2	11.9	86.5

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant Identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
STUART 1	2.5	Plant has more than 3 stacks		2.0	0.0	0.0
STUART 2	2.5	0.0	0.0	2.0	0.0	0.0
STUART 3	2.5	0.0	0.0	2.0	0.0	0.0
STUART 4	2.5	0.0	0.0	2.0	0.0	0.0
STUART PLANT	2.5	3.8	5.5	2.0	7.3	48.8
TAIT 3	0.0	0.0	0.0	0.0	0.0	0.0
TAIT 4	0.0	0.0	0.0	0.0	0.0	0.0
TAIT PLANT		SO_2 emissions are presently 1.75 lb/MM BTU; proposed regulation is 1.6 lb/MM BTU.				
TIDD 1	4.0	50 TPH coal cleaning not feasible		3.1		
TIDD 2	4.0	50 TPH coal cleaning not feasible		3.1		
TIDD 3	4.0	0.8	12.4	3.1	1.3	108.0
TIDD PLANT	4.0	1.4	12.4	3.1	2.1	108.0

Table 4-2: Section 5. ANNUAL COST ASSESSMENT FOR SO_2 CONTROL ALTERNATIVES FOR SELECTED OHIO POWER PLANTS

Plant identification	Coal cleaning					
	1.6 Specific gravity cleaning			1.3 Specific gravity cleaning		
	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required %	Emission level using cleaned coal, lb/MM Btu	Annual O&M cost, $/MM	Additional uncleaned coal required, %
TORONTO 12	3.2	1.3	12.0	2.5	2.0	106.0
TORONTO PLANT	3.2	1.3	12.0	2.5	2.0	106.0
WOODCOCK 1	0.0	0.0	0.0	0.0	0.0	0.0
WOODCOCK 2	0.0	0.0	0.0	0.0	0.0	0.0
WOODCOCK PLT.	0.0	SO_2 emissions are presently 1.79 lb/MM BTU; proposed regulation is 1.6 lb/MM BTU.				

APPENDIX A

POWER PLANT DATA FORMS

PLANT ACME

LOCATION Lucas

Data Sources 1974 FPC 67

Boiler I.D.	16	91	92	13	14	15			
Boiler type	Dry	Coal/gas[b]	Coal/gas[b]	Coal/gas[b]	Coal/gas[b]	Coal/gas[b]			
Year installed	1951	1949	1949	1938	1941	1941			
Age	25	27	27	38	35	35			
Life remaining, years	15	13	13	2	5	5			
Stack height, ft	246	298	298	298	298	298			
Stack identification no.	16	4	4	4	4	4			
Stack diameter, ft	-	-	-	-	-	-			
MW output	72	112.5[a]	112.5[a]	71	71	71			
Capacity factor	52.7	41.6	41.6	8.9	24.5	29.2			
Operating hours, hours/yr	7597	6159	5867	1626	3174	3847			
Tons coal/hr max.	31	23	23	11	15	15			
Bbl. oil/hr max.	N/A	N/A	N/A	N/A	N/A	N/A			
Flow rate, acfm	273,000	952,000[c]	952,000[c]	952,000[c]	952,000[c]	952,000[c]			
Temperature, °F	327	404	404	404	404	404			
SO_x Reg., lb SO_2/MM Btu	1.9	1.2	1.2	1.2	1.2	1.2			
Ash content, %	16.6	16.6	16.6	16.6	16.6	16.6			
Sulfur content, %	2.3	2.3	2.3	2.3	2.3	2.3			
HHV, Btu/lb coal	11,130	11,130	11,130	11,130	11,130	11,130			
Btu/gal oil	N/A	N/A	N/A	N/A	N/A	N/A			
Type control particulate	ESP[d]	ESP[d]	ESP[d]	ESP	ESP	ESP			
Efficiency, %	98.7	96.7	99.7	99.5	99.5	99.5			
Particulate emissions, lb/MM Btu	0.19	0.38	0.38	0.38	0.38	0.38			
Year control system installed	1951	1950	1950	1970	1971	1970			
Consumption, coal, TPY	155,000	207,000[e]	207,000[e]	←	122,000	→			
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF	765	297	297	17	17	17			

[a] One generator driven by boilers 91 and 92.

[b] Dry bottom.

[c] Total acfm for boilers 91, 92, 13, 14 and 15.
N/A - not available.

[d] Boilers 16, 91 and 92 include a mechanical collector.

[e] Total for boilers 91 and 92.

PLANT ACME (continued)

LOCATION Lucas

Data Sources 1974 FPC 67

Boiler I.D.	9	10	11	12					
Boiler type	Oil/gas	Oil/gas	Oil/gas	Oil/gas					
Year installed	1970	1970	1970	1970					
Age	6	6	6	6					
Life remaining, years	34	34	34	34					
Stack height, ft	275	275	275	275					
Stack identification no.	2	2	3	3					
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.					
MW output	60	60	60	60					
Capacity factor	16.4	15.9	11.1	10.6					
Operating hours, hours/yr	2146	2080	1391	1786					
Tons coal/hr max.	68.72	68.72	68.72	68.72					
Bbl. oil/hr max.	-	-	-	-					
Flow rate, acfm	220,000	200,000	200,000	200,000					
Temperature, °F	740	740	740	740					
SO_x Reg., lb SO_2/MM Btu	1.6	1.6	1.6	1.6					
Ash content, %	N/A	N/A	N/A	N/A					
Sulfur content, %	1.8	1.8	1.8	1.8					
HHV, Btu/lb coal	N.A.	N.A.	N.A.	N.A.					
Btu/gal oil	156,000	156,000	156,000	156,000					
Type control particulate	None	None	None	None					
Efficiency, %	0	0	0	0					
Particulate emissions, lb/MM Btu	-	-	-	-					
Year control system installed									
Consumption, coal, TPY									
Consumption, oil, 1000 bbl/yr	← 188 →								
Consumption, gas, 10^6 CF	← 9 →								

N.A. - not available

PLANT ASHTABULA

LOCATION Ashtabula

Data Source 1974 FPC 67

Boiler I.D.	7	8	9	10	11				
Boiler type	Pulv.Dry[a]	Pulv.Dry[b]	Pulv.Dry[b]	Pulv.Dry[b]	Pulv.Dry[b]				
Year installed	1958	1948	1948	1948	1948				
Age	18	28	28	28	28				
Life remaining, years	22	12	12	12	12				
Stack height, ft	373								
Stack identification no.	4	5	5	5	5				
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.				
MW output	256	46	46	46	46				
Capacity factor	77.9	69.3	66.6	66.1	72.3				
Operating hours, hours/yr	7741	5293	5091	5111	5503				
Tons coal/hr max.	92	21.5	21.5	21.5	21.5				
Bbl. oil/hr max.									
Flow rate, acfm	700,000	1,750,000[c]	1,750,000[c]	1,750,000[c]	1,750,000[c]				
Temperature, °F	255	250	250	250	250				
SO_x Reg., lb SO_2/MM Btu	1.2	1.2	1.2	1.2	1.2				
Ash content, %	17.98	17.98	17.98	17.98	17.98				
Sulfur content, %	2.71	2.71	2.71	2.71	2.71				
HHV, Btu/lb coal	11,109	11,109	11,109	11,109	11,109				
Btu/gal oil	149,802	149,802	149,802	149,802	149,802				
Type control particulate	ESP	ESP	ESP	ESP	ESP				
Efficiency, %	95.6	93.2	96.0	96.0	96.0				
Particulate emissions, lb/MM Btu	6.55	1.73	1.73	1.73	1.73				
Year control system installed	1958	1958	1958	1958	1958				
Consumption, coal, TPY	709,700	159,600	153,100	151,900	166,200				
Consumption, oil, 1000 bbl/yr	-	-	-	-	-				
Consumption, gas, 10^6 CF	5.4	.6	.6	.6	.6				

[a] PCTA DRY BOTTOM

[b] PCFR DRY BOTTOM

[c] Total flow for Boilers 8, 9, 10 and 11.

N.A. - not available.

PLANT ASHTABULA (continued)

LOCATION Ashtabula

Data Sources 1974 FPC 67

Boiler I.D.	1	2	3	4	5	6			
Boiler type	Ropp Dry	Ropp Dry	Ropp Dry	Ropp Dry	Ropp Dry	Ropp Dry			
Year installed	1930	1930	1930	1930	1930	1930			
Age	46	46	46	46	46	46			
Life remaining, years	-	-	-	-	-	-			
Stack height, ft	274	274	274	274	274	274			
Stack identification no.	1,2,3	1,2,3,	1,2,3	1,2,3	1,2,3	1,2,3			
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.			
MW output	33.3	33.3	33.3	33.3	33.3	33.3			
Capacity factor	18.6	17.3	18.8	16.3	16.8	17.3			
Operating hours, hours/yr	3074	2863.0	3117	2669	2757	2826			
Tons coal/hr max.									
Bbl. oil/hr max.	71.4	71.4	71.4	71.4	71.4	71.4			
Flow rate, acfm	300,000	300,000	300,000	300,000	300,000	300,000			
Temperature, °F	480	480	480	480	480	480			
SO_x Reg., lb SO_2/MM Btu	1.2	1.2	1.2	1.2	1.2	1.2			
Ash content, %	N/A	N/A	N/A	N/A	N/A	N/A			
Sulfur content, % oil	1.2	1.2	1.2	1.2	1.2	1.2			
HHV, Btu/lb coal	-	-	-	-	-	-			
Btu/gal oil	149,802	149,802	149,802	149,802	149,802	149,802			
Type control particulate	-	-	-	-	-	-			
Efficiency, %	-	-	-	-	-	-			
Particulate emissions, lb/MM Btu	-	-	-	-	-	-			
Year control system installed	-	-	-	-	-	-			
Consumption, coal, TPY	-	-	-	-	-	-			
Consumption, oil, 1000 bbl/yr	0.1865	0.1731	0.1884	0.1633	0.1680	0.1728			
Consumption, gas, 10^6 CF	-	-	-	-	-	-			

N.A. - not available

PLANT AVON LAKE

LOCATION Lorain County

Data Sources 1974 FPC-67

Boiler I.D.	1	2	3	4	5	6	7	8	
Boiler type	Bopp Dry	Bopp Dry	Bopp Dry	Bopp Dry	Bopp Dry	Bopp Dry	Bopp Dry	Bopp Dry	
Year installed	1926	1926	1926	1926	1928	1928	1929	1929	
Age	50	50	50	50	48	48	47	47	
Life remaining, years	-	-	-	-	-	-	-	-	
Stack height, ft									
Stack identification no.	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	1,2,3,4	
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	
MW output	23.75	23.75	23.75	23.75	23.75	23.75	23.75	23.75	
Capacity factor	11.4	9.7	12.0	8.5	9.3	12.4	7.7	11.7	
Operating hours, hours/yr	1541	1314	1669	1146	1304	1727	1070	1601	
Tons coal/hr max.	-	-	-	-	-	-	-	-	
Bbl. oil/hr max.	60	60	60	60	60	60	60	60	
Flow rate, acfm	(235,000x4	(235,000x4	(235,000x4	(235,000x4	(235,000x4	(235,000x4	(235,000x4	(235,000x4)	
Temperature, °F	404	404	404	404	404	404	404	404	
SO_x Reg., lb SO_2/MM Btu									
Ash content, %	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sulfur content, %	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
HHV, Btu/lb coal									
Btu/gal oil	147,630	147,630	147,630	147,630	147,630	147,630	147,630	147,630	
Type control particulate	-	-	-	-	-	-	-	-	
Efficiency, %	-	-	-	-	-	-	-	-	
Particulate emissions, lb/MM Btu	-	-	-	-	-	-	-	-	
Year control system installed	-	-	-	-	-	-	-	-	
Consumption, coal, TPY	-	-	-	-	-	-	-	-	
Consumption, oil, 1000 bbl/yr	76.4	65.1	80.6	56.8	62.5	83.1	51.7	78.7	
Consumption, gas, 10^6 CF	-	-	-	-	-	-	-	-	

N.A. - not available.

PLANT AVON LAKE

LOCATION Lorain County

Data Sources 1974 FPC-67

	PCTA	PCTA	PCTA	PCFR					
Boiler I.D.	9	10	11	12					
Boiler type	Dry Bottom	Dry Bottom	Dry Bottom	Fly Ash Injection					
Year installed	1949	1949	1959	1970					
Age	27	27	17	6					
Life remaining, years	13	13	23	34					
Stack height, ft	295	295	392	600					
Stack identification no.	5	6	7	8					
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.					
MW output	86	86	233	680					
Capacity factor	63.2	54.3	59.9	77.1					
Operating hours, hours/yr	8273	6599	6608	7592					
Tons coal/hr max.									
Bbl. oil/hr max.	46	46	85	230					
Flow rate, acfm	339,230	339,230	639,660	1,762,000					
Temperature, °F	266	266	240	285					
SO_x Reg., lb SO_2/MM Btu	1.8	1.8	1.3	1.2					
Ash content, %	15.7	15.7	15.7	15.7					
Sulfur content, %	2.93	2.93	2.93	2.93					
HHV, Btu/lb coal	11,315	11,315	11,315	11,315					
Btu/gal oil	147,630	147,630	147,630	147,630					
Type control particulate	ESP	ESP	ESP	ESP					
Efficiency, %	95	95	97	99.5					
Particulate emissions, lb/MM Btu	0.43	0.43	0.26	0.05					
Year control system installed	1949	1949	1959	1970					
Consumption, coal, TPY	263,900	212,200	565,600	1,763,900					
Consumption, oil, 1000 bbl/yr	1.5	1.7	3.1	7.5					
Consumption, gas, 10^6 CF	-	-	-	-					

N.A. - not available

PLANT BAY SHORE

LOCATION Oregon - Lucas Co.

Data Sources 1974 FPC 67

Boiler I.D.	1	2	3	4					
Boiler type	OTHE	OTHE	Dry[a]	Dry[a]					
Year installed	1955	1959	1963	1968					
Age	21	17	13	8					
Life remaining, years	19	23	27	32					
Stack height, ft	250	250	250	250					
Stack identification no.	1	2	3	4					
Stack diameter, ft									
MW output	140	140	140	218					
Capacity factor	76.37	80.01	76.90	83.99					
Operating hours, hours/yr	7889.43	8356.45	7697.25	8760.00					
Tons coal/hr max.	49	49	50	75					
Bbl. oil/hr max.	-	-	-	-					
Flow rate, acfm	392,000	392,000	390,000	582,000					
Temperature, °F	266	266	265	276					
SO_x Reg., lb SO_2/MM Btu	1.5	1.5	1.5	1.3					
Ash content, %	12.6	12.6	12.6	12.6					
Sulfur content, %	2.0	2.0	2.0	2.0					
HHV, Btu/lb coal	11,944	11,944	11,944	11,944					
Btu/gal oil	139,784	139,784	139,784	139,784					
Type control particulate	ESP[b]	ESP[b]	ESP	ESP					
Efficiency, %	98.5	98.8	98.5	99.5					
Particulate emissions, lb/MM Btu	0.37	0.09	0.04	0.04					
Year control system installed	1955	1959	1963	1968					
Consumption, coal, TPY	342,210	365,720	351,990	595,660					
Consumption, oil, 1000 bbl/yr	3.29	5.53	5.03	2.83					
Consumption, gas, 10^6 CF	-	-	-	-					

[a] PCFB

[b] In addition Boilers 1 and 2 have mechanical collector

PLANT BECKJORD

LOCATION New Richmond - Clermont Co.

Data Sources 1974 FPC-67; 12/4/74 - 114 letter

Boiler I.D.	1	2	3	4	5	6			
Boiler type	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[b]	Pulv.Dry[b]	Pulv.Dry[a]	Pulv.Dry[a]			
Year installed	1952	1953	1954	1958	1962	1969			
Age	24	23	22	18	14	7			
Life remaining, years	16	17	18	22	26	33			
Stack height, ft	300'	300'	375'	375'	452'	452'			
Stack identification no.	1	2	3	4	5	5			
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.			
MW output	100	100	125	163	240	434			
Capacity factor	44.5	47.36	49.05	60.71	72.22	29.68			
Operating hours, hours/yr	5968.37	6190.42	5793.47	7366.75	7843.95	3665.87			
Tons coal/hr max.	46.3	47.6	57.7	67.7	287.3	287.3			
Bbl. oil/hr max.	-	-	-	-	-	-			
Flow rate, acfm	363,800	368,200	450,000	491,900	2,174,400[c]	2,174,400[c]			
Temperature, °F	346	313	296	263	279	279			
SO_x Reg., lb SO_2/MM Btu	0.6[d]	0.6[d]	0.6[d]	0.6[d]	0.6[d]	0.6[d]			
Ash content, %	23.08	23.08	23.08	23.08	23.08	23.08			
Sulfur content, %	2.35	2.35	2.33	2.36	2.39	2.39			
HHV, Btu/lb coal	10,491	10,481	10,535	10,517	10,615	10,615			
Btu/gal oil	137,235	137,235	137,235	137,235	137,235	137,235			
Type control particulate	ESP	ESP	ESP	ESP	ESP	ESP			
Efficiency, %	92	92	99.83	94	95	97			
Particulate emissions, lb/MM Btu	1.09	1.09	0.02	0.82	0.68	0.41			
Year control system installed	1974	1974	1973	1958	1962	1969			
Consumption, coal, TPY	192,900	203,200	243,000	351,200	615,800	504,500			
Consumption, oil, 1000 bbl/yr	1.7	2.3	3.6	4.3	4.1	8.3			
Consumption, gas, 10^6 CF	-	-	-	-	-	-			

[a] PCTA

[b] PCFR

[c] Total flowrate for Boilers 5 and 6.

[d] Regulation at 425 ft.

[e] In addition Boiler 4 has a mechanical collector.

N.A. = Not available.

PLANT BURGER

LOCATION Shadyside - Belmont

Data Sources 1974 FPC - 67; 11/74 - 114 letter

Boiler I.D.	1	2	3	4	5	6	7	8
Boiler type	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]	Pulv.Dry[a]
Year installed	1944	1944	1947	1947	1950	1950	1955	1955
Age	32	32	29	29	26	26	21	21
Life remaining, years	8	8	11	11	14	14	19	19
Stack height, ft	850	850	850	850	850	850	850	850
Stack identification no.	6	6	6	6	6	6	6	6
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
MW output	31.25	31.25	31.25	31.25	50	50	159.5	159.5
Capacity factor	40.42	42.71	41.67	41.59	47.15	45.55	78.03	80.11
Operating hours, hours/yr	6032	5994	5692	5718	6035	6141	8086	6752
Tons coal/hr max.	17.85	17.85	17.85	17.85	26.1	26.1	62.5	62.5
Bbl. oil/hr max.	-	-	-	-	-	-	-	-
Flow rate, acfm	2,071,744[b]	2,071,744[b]	2,071,744[b]	2,071,744[b]	2,071,744[b]	2,071,744[b]	2,071,744[b]	2,071,744[b]
Temperature, °F	344	344	344	344	344	344	344	344
SO_x Reg., lb SO_2/MM Btu	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Ash content, %	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9
Sulfur content, %	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
HHV, Btu/lb coal	10,954	10,954	10,954	10,954	10,954	10,954	10,954	10,954
Btu/gal oil	-	-	-	-	-	-	-	-
Type control particulate	ESP	ESP	ESP	ESP	ESP	ESP	ESP	ESP
Efficiency, %	96.3	98.6	96.5	98.2	99.3	99.0	81.1	82.0
Particulate emissions, lb/MM Btu	0.05	0.14	0.02	3.31	0.05	0.04	0.31	0.31
Year control system installed	-	-	-	-	-	-	-	-
Consumption, coal, TPY	85,300	84,400	81,900	82,700	124,000	127,400	472,500	390,300
Consumption, oil, 1000 bbl/yr	-	-	-	-	-	-	-	-
Consumption, gas, 10^6 CF	-	-	-	-	-	-	-	-

[a] PCFB

[b] Total for Boilers 1, 2, 3, 4, 5, 6, 7 and 8.

N.A. - not available

PLANT CARDINAL

LOCATION Brilliant, Ohio - Jefferson Co.

Data Sources 1974 FPC - 67, April 3, 1975 - 114 letter

Boiler I.D.	1	2							
Boiler type	Pulv.Dry[a]	Pulv.Dry[a]							
Year installed	1967	1967							
Age	9	9							
Life remaining, years	31	31							
Stack height, ft	825	825							
Stack identification no.	1	2							
Stack diameter, ft	N.A.	N.A.							
MW output	590	590							
Capacity factor	N A	N A							
Operating hours, hours/yr	5905	6670							
Tons coal/hr max.	247.5	247.5							
Bbl. oil/hr max.	-	-							
Flow rate, acfm	1,792,028	1,792,028							
Temperature, °F	339	339							
SO_x Reg., lb SO_2/MM Btu	1.2	1.2							
Ash content, %	14.67	14.67							
Sulfur content, %	2.67	2.67							
HHV, Btu/lb coal	10,303	10,303							
Btu/gal oil	134,500	134,500							
Type control particulate	ESP	ESP							
Efficiency, %	95	95							
Particulate emissions, lb/MM Btu	4.82	4.83							
Year control system installed	1967	1967							
Consumption, coal, TPY	1,149,600	1,305,100							
Consumption, oil, 1000 bbl/yr	21.7	31.2							
Consumption, gas, 10^6 CF	-	-							

[a] PCFB

N.A. - not available

PLANT CONESVILLE

LOCATION Conesville, Coshocton

Data Sources 1974 FPC-67; April 4, 1975 - APER

Boiler I.D.	1	2	3	4	5*				
Boiler type	Cyc. Wet	Cyc. Wet	Pulv.Dry[a]	Pulv.Dry[b]	-				
Year installed	1959	1957	1962	1973	1975				
Age	17	19	14	3	1				
Life remaining, years	23	21	26	37	39				
Stack height, ft	450	450	450	450	450				
Stack identification no.	1	1	2	3	4				
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.				
MW output	125	125	125	787	411				
Capacity factor	64.0	64.0	66.0	66.7	44.0				
Operating hours, hours/yr	7613	6203	6239	7688	-				
Tons coal/hr max.	59.5	59.5	87.8	322.5	-				
Bbl. oil/hr max.	-	-	-	-	-				
Flow rate, acfm	924,000[c]	924,000[c]	483,000	2,847,000	1,545,000				
Temperature, °F	290	290	290	280	300				
SO_x Reg., lb SO_2/MM Btu	4.0	4.0	4.0	4.0	4.0				
Ash content, %	17.7	17.7	17.7	17.7	17.7				
Sulfur content, %	4.47	4.47	4.47	4.47	4.47				
MHV, Btu/lb coal	10,350	10,350	10,350	10,350	10,350				
Btu/gal oil	-	-	-	-	-				
Type control particulate	None	None	Cyclone	ESP	ESP				
Efficiency, %	-	-	60.0	993.0	N.A.				
Particulate emissions, lb/MM Btu	15.03	15.03	6.01	0.10	-				
Year control system installed	-	-	1962	1973	-				
Consumption, coal, TPY	399,000	317,000	355,000	2,098,000	766,000				
Consumption, oil, 1000 bbl/yr	-	-	-	-					
Consumption, gas, 10^6 CF	-	-	-	-	-				

*No. 5 under construction - not included.

[a] PCFR

[b] PCTA

[c] Total flowrate for

N.A. - not available

PLANT EAST LAKE

LOCATION East Lake Cr

Data Sources FPC-67

Boiler I.D.	1	2	3	4	5				
Boiler type	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[b]				
Year installed	1953	1953	1954	1956	1972				
Age	23	23	22	20	4				
Life remaining, years	17	17	18	20	36				
Stack height, ft	300	300	300	300	300				
Stack identification no.	1	2	3	4	5				
Stack diameter, ft	N/A	N/A	N/A	N/A	N/A				
MW output	123	123	123	208	680				
Capacity factor	72.7	69.1	73.5	55.1	62.5				
Operating hours, hours/yr	8253	7868	8173	6079	6627				
Tons coal/hr max.	53	53	53	92	230				
Bbl. oil/hr max.									
Flow rate, acfm	381,000	381,000	381,000	580,000	1,760,000				
Temperature, °F	262	262	262	235	285				
SO_x Reg., lb SO_2/MM Btu	1.6	1.6	1.6	1.4	1.2				
Ash content, %	15.66	15.66	15.66	15.66	15.66				
Sulfur content, %	2.62	2.62	2.62	2.62	2.62				
HHV, Btu/lb coal	11,632	11,632	11,632	11,632	11,632				
Btu/gal oil	137,352	137,352	137,352	137,352	137,352				
Type control particulate	Cyclone ESP	Cyclone ESP	Cyclone ESP	Cyclone ESP	ESP				
Efficiency, %	97.0	99.5	95.0	95.0	98.4				
Particulate emissions, lb/MM Btu	0.21	0.21	0.21	0.39	0.05				
Year control system installed	1953	1953	1954	1956	1972				
Consumption, coal, TPY	353,800	336,700	357,600	479,500	1,406,500				
Consumption, oil, 1000 bbl/yr	1.4	2.0	1.7	3.9	7.2				
Consumption, gas, 10^6 CF	-	-	-	-	-				

[a] PCTA

[b] PCDP with fly ash injection

N/A - not available

PLANT EDGEWATER

LOCATION Lorain

Data Sources 1974 FPC 67

Boiler I.D.	11	12	13						
Boiler type	Pulv. dry	Pulv. dry	Pulv. dry						
Year installed	1949	1949	1957						
Age	27	27	19						
Life remaining, years	13	13	21						
Stack height, ft	254	254	280						
Stack identification no.	1	1	2						
Stack diameter, ft	N/A	N/A	N/A						
MW output	88	88	105						
Capacity factor	43.74	39.68	71.41						
Operating hours, hours/yr	4876	4585	8367						
Tons coal/hr max.	17.8	17.8	42.5						
Bbl. oil/hr max.									
Flow rate, acfm	312,000	312,000	307,000						
Temperature, °F	348	348	275						
SO_x Req., lb SO_2/MM Btu	1.4	1.4	1.7						
Ash content, %	13.0	13.0	13.0						
Sulfur content, %	2.7	2.7	2.7						
HHV, Btu/lb coal	11,633	11,633	11,633						
Btu/gal oil	-	-	-						
Type control particulate	Cyclone & ESP	Cyclone & ESP	ESP						
Efficiency, %	97.5	98.2	80.8						
Particulate emissions, lb/MM Btu	-	-	-						
Year control system installed	1970	1970	1957						
Consumption, coal, TPY	70,700	67,800	286,500						
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF									

N/A - Not available.

PLANT GAVIN

LOCATION Gallia

Data Sources 1974 FPC 67; 4/2/75 - 114 letter

Boiler I.D.	1	2							
Boiler type	Pulv. dry	-							
Year installed	1974	1975							
Age	2	1							
Life remaining, years	38	39							
Stack height, ft	N/A	N/A							
Stack identification no.	1	1							
Stack diameter, ft	N/A	N/A							
MW output	1300	1300							
Capacity factor	N A	N A							
Operating hours, hours/yr	1553	-							
Tons coal/hr max.	480	480							
Bbl. oil/hr max.	-	-							
Flow rate, acfm	8,411,900	-							
Temperature, °F	308	300							
SO_x Req., lb SO_2/MM Btu	4.4	4.4							
Ash content, %	15.7	15.7							
Sulfur content, %	3.7	3.7							
HHV, Btu/lb coal	10,246	10,246							
Btu/gal oil	133,218	-							
Type control particulate	ESP	-							
Efficiency, %	99.87	-							
Particulate emissions, lb/MM Btu	-	-							
Year control system installed	1974	-							
Consumption, coal, TPY	805,500	-							
Consumption, oil, 1000 bbl/yr	27.2	-							
Consumption, gas, 10^6 CF		-							

[a] PCOP

N/A - not available.

PLANT GORGE

LOCATION Akron - Summit County

Data Sources 1974 FPC 67

Boiler I.D.	25	26							
Boiler type	Dry	Dry							
Year installed	1943	1948							
Age	33	28							
Life remaining, years	7	12							
Stack height, ft	275.	275							
Stack identification no.	1	2							
Stack diameter, ft	N/A	N/A							
MW output	44	44							
Capacity factor	77.45	74.35							
Operating hours, hours/yr	6225	7075							
Tons coal/hr max.	26.5	26.4							
Bbl. oil/hr max.	-	-							
Flow rate, acfm	216,000	215,000							
Temperature, °F	382	343							
SO_x Req., lb SO_2/MM Btu	2.2	2.2							
Ash content, %	14.5	14.5							
Sulfur content, %	3.3	3.3							
HHV, Btu/lb coal	10,986	10,986							
Btu/gal oil	-	-							
Type control particulate	ESP	ESP							
Efficiency, %	86.7	95.4							
Particulate emissions, lb/MM Btu	-	-							
Year control system installed	1943	1948							
Consumption, coal, TPY	126,700	149,800							
Consumption, oil, 1000 bbl/yr	-	-							
Consumption, gas, 10^6 CF	-	-							

N/A - Not available.

PLANT O. H. HUTCHINGS

LOCATION Miamisburg - Montgomery

Data Sources 1974 FPC 67

Boiler I.D.	1	2	3	4	5	6			
Boiler type	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]	Pulv. dry[a]			
Year installed	1948	1949	1950	1951	1952	1953			
Age	28	27	26	25	24	23			
Life remaining, years	12	13	14	15	16	17			
Stack height, ft	N/A	N/A	N/A	N/A	N/A	N/A			
Stack identification no.	1	1	2	2	3	3			
Stack diameter, ft	N/A	N/A	N/A	N/A	N/A	N/A			
MW output	69	69	69	69	69	69			
Capacity factor	38.79	43.35	66.45	73.59	69.87	68.18			
Operating hours, hours/yr	4221.6	4680.3	6481.8	7080.9	6934.9	6779.1			
Tons coal/hr max.	24	24	23.4	23.4	23.4	23.4			
Bbl. oil/hr max.	-	-	-	-	-	-			
Flow rate, acfm	476,000[a]	476,000[a]	460,000[b]	460,000[b]	461,000[c]	461,000[c]			
Temperature, °F	308	308	305	305	305	305			
SO_x Reg., lb SO_2/MM Btu	1.6	1.6	1.6	1.6	1.6	1.6			
Ash content, %	14.1	14.1	14.1	14.1	14.1	14.1			
Sulfur content, %	1.0	1.0	1.0	1.0	1.0	1.0			
HHV, Btu/lb coal	1,045	1,046	1,046	1,046	1,046	1,046			
Btu/ft^3 gas	11,669	11,669	11,669	11,669	11,669	11,669			
Type control particulate	ESP	ESP	ESP	ESP	ESP	ESP			
Efficiency, %	99.8	99.9	99.9	99.9	99.9	99.8			
Particulate emissions, lb/MM Btu	.01	.01	.01	.01	.01	.01			
Year control system installed	1973	1973	1973	1972	1972	1972			
Consumption, coal, TPY	90,000	100,000	135,600	153,400	144,800	141,400			
Consumption, oil, 1000 bbl/yr	-	-	-	-	-	-			
Consumption, gas, 10^6 CF	119.9	132.2	234.7	213.5	222.1	220.7			

a) PCTA

b) Total acfm for boilers 1 and 2

c) Total acfm for boilers 3 and 4

d) Total acfm for boilers 5 and 6

N/A - not available

PLANT Eyger Creek

LOCATION Gallipolis, Gallia Co.

Data Sources 1974 FPC 67; 4/3/75 - 114 letter

Boiler I.D.	1	2	3	4	5
Boiler type	Pulv.Wet	Pulv.Wet	Pulv.Wet	Pulv.Wet	Pulv.Wet
Year installed	1955	1955	1955	1955	1955
Age	21	21	21	21	21
Life remaining, years	19	19	19	19	19
Stack height, ft	538	538			
Stack identification no.	1	1	2	3	3
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.
MW output	217	217	217	217	217
Capacity factor	82.8	83.1	84.3	89.6	87.1
Operating hours, hours/yr	7766	7728	7952	8380	8202
Tons coal/hr max.	85.0	85.1	84.4	85.3	84.7
Bbl. oil/hr max.	-	-	-	-	-
Flow rate, acfm	1,250,000[a]	1,250,000[a]	625,000	1,250,000[b]	1,250,000[b]
Temperature, °F	340	340	340	340	340
SO_x Reg., lb SO_2/MM Btu	4.4	4.4	4.4	4.4	4.4
Ash content, %	14.7	14.7	14.7	14.7	14.7
Sulfur content, %	3.81	3.81	3.81	3.81	3.81
HHV, Btu/lb coal	11,230	11,230	11,230	11,230	11,230
Btu/gal oil	-	-	-	-	-
Type control particulate	ESP[c]	ESP[c]	ESP[c]	ESP[c]	ESP[c]
Efficiency, %	96.1	96.1	96.1	96.1	96.1
Particulate emissions, lb/MM Btu	0.41	0.41	0.41	0.41	0.41
Year control system installed	-	-	-	-	-
Consumption, coal, TPY	660,000	663,000	671,000	714,000	694,000
Consumption, oil, 1000 bbl/yr	-	-	-	-	-
Consumption, gas, 10^6 CF	-	-	-	-	-

Total coal consumption - 3,402,000 tons/year

[a] Total acfm for Boilers 1 and 2

[b] Total acfm for Boilers 4 and 5

[c] In addition boiler has a cyclone unit.

N.A. - not available.

PLANT LAKE SHORE

LOCATION Cuyahoga

Data Sources 1974 FPC-67

Boiler I.D.	91	92	93	94	18				
Boiler type	Pulv.Wet	Pulv.Wet	Pulv.Wet	Pulv.Wet	Pulv.Wet				
Year installed	1941	1941	1951	1951	1962				
Age	35	35	25	25	14				
Life remaining, years	5	5	15	15	26				
Stack height, ft	268	268	268	268	320				
Stack identification no.	1	2	3	4	5				
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.				
MW output	60	60	69	69	256				
Capacity factor	35.7	39.3	51.7	56.1	69.5				
Operating hours, hours/yr	4872	5469	6336	6432	7910				
Tons coal/hr max.	25.2	25.2	33.3	33.3	88.4				
Bbl. oil/hr max.	-	-	-	-	-				
Flow rate, acfm	169,300	169,300	214,800	214,800	719,600				
Temperature, °F	265	265	255	255	307				
SO_x Reg., lb SO_2/MM Btu	2.0	2.0	1.9	1.9	1.3				
Ash content, %	17.01	17.01	17.01	17.01	17.01				
Sulfur content, %	2.03	2.03	2.03	2.03	2.03				
HHV, Btu/lb coal	11,134	11,134	11,134	11,134	11,134				
Btu/gal oil	-	-	-	-	-				
Type control particulate	ESP	ESP	ESP	ESP	ESP				
Efficiency, %	79.3	59.8	92	94	98				
Particulate emissions, lb/MM Btu	1.69	3.28	0.65	0.49	0.16				
Year control system installed	1941	1941	1951	1951	1962				
Consumption, coal, TPY	129,000	141,000	187,900	203,900	716,600				
Consumption, oil, 1000 bbl/yr	2.3	2.4	1.3	1.1	7.6				
Consumption, gas, 10^6 CF	-	-	-	-	-				

N.A. - not available

PLANT MAD RIVER

LOCATION Springfield - Clark

Data Sources 1974 FPC 67

Boiler I.D.	1	2	3	4					
Boiler type	Stoker	Stoker	Pulv.Dry	Pulv.Dry					
Year installed	1927	1927	1938	1948					
Age	49	49	38	27					
Life remaining, years	-	-	2	13					
Stack height, ft	130	130	275	275					
Stack identification no.	1	2	3	3					
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.					
MW output	25	25	25	25					
Capacity factor	20.3	22.7	37.0	54.6					
Operating hours, hours/yr	2942	3302	4448	8211					
Tons coal/hr max.	8.5	8.5	11.5	15.7					
Bbl. oil/hr max.	-	-	-	-					
Flow rate, acfm	120,000	120,000	224,000	224,000					
Temperature, °F	440	440	316	316					
SO_x Reg., lb SO_2/MM Btu	5.2	5.2	5.2	5.2					
Ash content, %	15.5	15.5	15.5	15.5					
Sulfur content, %	1.4	1.4	1.4	1.4					
HHV, Btu/lb coal	10,934	10,934	10,934	10,934					
Btu/gal oil	-	-	-	-					
Type control particulate	Multi-cyclone	Multi-cyclone	Multi-cyclone	Multi-cyclone					
Efficiency, %	55	55	79	80					
Particulate emissions, lb/MM Btu	4.25	4.25	1.98	1.89					
Year control system installed	1945	1945	1938	1948					
Consumption, coal, TPY	17,400	20,300	37,700	77,200					
Consumption, oil, 1000 bbl/yr	-	-	-	-					
Consumption, gas, 10^6 CF	-	-	-	-					

[a]Total acfm for Boilers 3 and 4.

N.A. - not available

PLANT MIAMI FORT

LOCATION Hamilton Co.

Data Sources 1974 FPC 67

Boiler I.D.	3-1 & 3-2	4-1 & 4-2	5-1 & 5-2	6	7	8			
Boiler type	RFRO -	PCFR wet	PCFR dry	PCFR dry	-				
Year installed	1938	1942	1949	1960					
Age	38	34	27	16	-				
Life remaining, years	2	6	13	24	-				
Stack height, ft	194	375	230	375	800				
Stack identification no.	2	3	3	4	5	6			
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.				
MW output 2@	65	65	100	168	500				
Capacity factor	14.38	26.06	67.73	87.90	-				
Operating hours, hours/yr	4310.3	7900.11	15,393.28	8117.96	-				
Tons coal/hr max.		85.2[a]	85.2[a]	62.0	-				
Bbl. oil/hr max. 2@	72.6	-	-	-	-				
Flow rate, acfm	327,300	736,400	736,400	538,100	-				
Temperature, °F	391	390	390	276	-				
SO_2 Req., lb SO_2/MM Btu	1.4	1.2	1.2	1.2	1.2				
Ash content, %	14.76	14.76	14.76	14.76	14.76				
Sulfur content, %	3.22	3.22	3.22	3.22	3.22				
MHV, Btu/lb coal	-	10,908	10,908	10,908	10,908				
Btu/gal oil	137,565	-	-	-	-				
Type control particulate	None	None	None	Mech. & ESP	ESP				
Efficiency, %	0	0	0	94	N.A.				
Particulate emissions, lb/MM Btu	0.06	11.32	11.32	0.68	-				
Year control system installed	-	-	-	1960	1975				
Consumption, coal, TPY	-	105,200	260,300	496,700	-				
Consumption, oil, 1000 bbl/yr	235.7	4.3	7.1	2.9	-				
Consumption, gas, 10^6 CF	-	-	-	-	-				

[a]Combined rate for Boilers 4-1, 4-2, 5-1 and 5-2.

N.A. - not available.

Plant [illegible]

Location [illegible] Beverly - Washington Co.

Data Sources [illegible]

Boiler I.D.	1	2	3	4	5				
Boiler type	Wet Pulv.[a]	Wet Pulv[a]	Cyclone[b]	Cyclone[b]	Pulv.Dry[c]				
Year installed	1953	1954	1957	1958	1968				
Age	23	22	19	18	8				
Life remaining, years	17	18	21	22	32				
Stack height, ft	825	825	825	825	825				
Stack identification no.	1A	1A	1A	1A	2				
Stack diameter, ft	N.A.	N.A.	N.A.	N.A.	N.A.				
MW output	213	213	225	225	590.8				
Capacity factor	N.A.	N.A.	N.A.	N.A.	N.A.				
Operating hours, hours/yr	6924	7292	6991	6924	6154				
Flue coal/hr max.	77	88	81.4	81.4	247.5				
Oil, oil/hr max.									
Flue rate, acfs	2,572,000[d]	2,572,000[d]	2,572,000[d]	2,572,000[d]	1,712,000[d]				
Temperature, °F	315	315	315	315	315				
SO_2 Reg., lb SO_2/MM Btu	2.4	2.4	2.4	2.4	2.4				
Ash content, %	19.66	19.66	19.66	19.66	19.66				
Sulfur content, %	5.0	5.0	5.0	5.0	5.0				
GHV, Btu/lb coal	10,310	10,310	10,310	10,310	10,310				
Btu/gal oil	137,745	137,745	137,745	137,745	137,745				
Type control particulate	Cyclone & ESP	Cyclone & ESP	ESP	ESP	ESP				
Efficiency, %	99.3	99.3	92.9	92.9	68				
Particulate emissions, lb/MM Btu	-	-	-	-	4.90				
Year control system installed	1972	1972	1972	1971	1968				
Consumption, coal, TPY	533,000	565,000	555,400	540,200	1,396,600				
Consumption, oil, 1000 bbl/yr	1.9	2.2	2.9	3.0	30.3				
Consumption, gas, 10^6 CF	-	-	-	-	-				

[a] Wet

[b] Wet

[c] Total acfs for Boilers 1, 2, 3 and 4

N.A. - Not available.

[illegible]

[illegible]

[illegible]

Boiler I.D.	1	2							
Boiler type	Wet Bottom	Wet Bottom							
Year installed	1954	1954							
Age	22	22							
Life remaining, years	18	18							
Stack height, ft	300	300							
Stack identification no.	1	2							
Stack diameter, ft	N.A.	N.A.							
MW output	125	125							
Capacity factor	71.1	74.4							
Operating hours, hours/yr	7963	7768							
Flow rate/hr max.	N.A.	N.A.							
Sol. oil/hr max.	-	-							
Flue rate, acfm	334,200	380,200							
Temperature, °F	270	270							
SO_2 Reg., lb SO_2/MM Btu	1.0	1.0							
Ash content, %	10.7	10.7							
Sulfur content, %	3.0	3.0							
HHV, Btu/lb coal	10,782	10,782							
Btu/gal oil	-	-							
Type control particulate	Cyclone	Cyclone							
Efficiency, %	70	70							
Particulate emissions, lb/MM Btu	3.45	3.45							
Year control system installed	1954	1954							
Consumption, coal, TPY	350,000	341,000							
Consumption, oil, 1000 bbl/yr	-	-							
Consumption, gas, 10^6 CF	-	-							

N.A. = not available

[illegible]

[illegible]

[illegible]

[illegible]	4	5	1	2	3				
[illegible]	Stoker	Pulv.Dry	Pulv.Dry	Pulv.Dry	Pulv.Dry				
[illegible]	1961	1969							
[illegible]	25	7							
[illegible]	25	33							
[illegible]	100	734							
[illegible]	4	5	1	2	2				
[illegible]	N.A.	N.A.	N.A.	N.A.	N.A.				
[illegible]	17	18.338	13	13	13				
[illegible]	18.38	34.14	0	0	0				
[illegible]	3197	6205	0	0	0				
[illegible]	6.65	8.91	-	2.85	2.85				
[illegible]	-	29.98	14.55	-	-				
[illegible]	65,070	66,894	38,278	79,878	79,878				
[illegible]	390	302	543	730	730				
[illegible]	4.8	4.8	4.8	4.8	4.8				
[illegible]	14.5	14.5							
[illegible]	3.7	3.7							
[illegible]	11,391	11,391							
[illegible]	138,000	138,000							
[illegible]	[illegible]	[illegible]							
[illegible]	88	98							
[illegible]	1.104	.169							
[illegible]	1961	1969							
[illegible]	9,200	29,800		0	0				
[illegible]		1.9	0						
[illegible]									

Plant: [illegible]

Location: [illegible]

Data Source: [illegible]

Boiler I.D.	41	42	41	52	6				
Boiler type	Pulv. dry[a]	pulv. dry[a]	pulv. dry[b]	Pul. dry	Cyclone Lat				
Year installed	1941	1941	1942	1942	1957				
Age	25	25	34	34	19				
Life remaining, years	5	5	6	6	21				
Stack height, ft	267[b]	267[b]	267[c]	267[c]	277				
Stack identification no.	6	6	5	5	6				
Stack diameter, ft	-	-	-	-	-				
GD output	85[b]	85[b]	85[c]	85[c]	125				
Capacity factor	N/A	N/A	N/A	N/A	N/A				
Operating hours, hours/yr	6771	6771	7704	7704	5678				
Bbl. oil/hr max.	N/A	N/A	N/A	N/A	N/A				
Flow rate, acfm	202,800[b]	202,800[b]	200,000[c]	200,000[c]	315,900				
Temperature, °F	365[b]	365[b]	365[c]	365[c]	316				
SO_2 Reg., lb SO_2/MM Btu	0.6	0.6	0.6	0.6	0.6				
Ash content, %	16.22	16.22	16.22	16.22	16.22				
Sulfur content, %	3.43	3.43	3.43	3.43	3.43				
HHV, Btu/lb coal	10,494	10,494	10,494	10,494	10,494				
Btu/gal oil	136,825	136,825	136,825	136,825	136,825				
Type control particulate	Mech.[b]	Mech.[b]	Mech.[c]	Mech.[c]	None				
Efficiency, %	85[b]	85[b]	85[c]	85[c]	-				
Particulate emissions, lb/MM Btu	7.23	7.23	7.23	7.23	-				
Year control system installed	1942	1942	1942	1942	-				
Consumption, coal, TPY	240,800[b]	240,800[b]	287,700[c]	287,700[c]	230,200				
Consumption, oil, 1000 bbl/yr	2.2[b]	2.2[b]	2.1[c]	2.1[c]	1.6				
Consumption, gas, 10^6 CF	-	-	-	-	-				

[a] Pure

[b] For boilers 41 and 42.

[c] For boilers 51 and 52.

N/A - not available.

PLANT PICWAY

LOCATION Lockbourne

Data Sources April 2, 1975 - APEB & Public Hearing
Date 1/13/76

Boiler I.D.	7	8	9						
Boiler type	Pulv. wet	Pulv. wet	Pulv. dry						
Year installed	1944	1948	1955						
Age	32	28	21						
Life remaining, years	8	12	19						
Stack height, ft	128	128	289						
Stack identification no.	1	2	3						
Stack diameter, ft	N/A	N/A	N/A						
MW output	30	30	85						
Capacity factor	33.2	35.9	50.9						
Operating hours, hours/yr	-	-	-						
Tons coal/hr max.	20	20	56.9						
Bbl. oil/hr max.	-	-	-						
Flue rate, acfm	172,000	171,000	386,000						
Temperature, °F	333	333	283						
SO_2 Emp., lb SO_2/MM Btu	6.0	6.0	6.0						
Ash content, %	12.6	12.6	12.6						
Sulfur content, %	4.29	4.29	4.29						
HHV, Btu/lb coal	10,212	10,212	10,212						
Btu/gal oil	-	-	-						
Type control particulate	-	-	Cyclone						
Efficiency, %	0	0	Est. 50						
Particulate emissions, lb/MM Btu	11.96	11.96	5.98						
Year control system installed	-	-	1955						
Consumption, coal, TPY	N/A	N/A	N/A						
Consumption, oil, 1000 bbl/yr	N/A	N/A	N/A						
Consumption, gas, 10^6 CF	N/A	N/A	N/A						

N/A = not available

Plant: Pigna

Location: Miami

Data Source: 1974 FPC 67

Boiler I.D.	1	2	3	4	5	6			
Boiler type	Stoker	Stoker	Stoker	Stoker	Stoker	Stoker			
Year installed	1933	1933	1940	1947	1951	1961			
Age	43	43	36	29	25	15			
Life remaining, years	-	-	4	11	15	25			
Stack height, ft	N/A	N/A	N/A	N/A	N/A	N/A			
Stack identification no.	1	1	2	3	4	5			
Stack diameter, ft									
GW output	33	33	33	33	33	20			
Capacity factor	15.9	20.6	9.3	47.6	44.4	48			
Operating hours, hours/yr	2797	3617	1642	8354	7786	8415			
Time coal/hr max.	3.2	3.2	3.2	10	10	13.7			
Oil, oil/hr max.									
Flue rate, acfm	82,000	82,000	41,000	61,414	61,900	64,000			
Temperature, °F	685	685	685	330	338	350			
CO_2 Req., lb CO_2/MM Btu	2.8	2.8	2.8	2.8	2.8	2.8			
Ash content, %	10.5	10.5	10.5	10.5	10.5	10.5			
Sulfur content, %	2.7	2.7	2.7	2.7	2.7	2.7			
HVA, Btu/lb coal	11,847	11,847	11,847	11,847	11,847	11,847			
Btu/gal oil									
Type control particulate				Mech.	Mech.	Mech.			
Efficiency, %				85	85	92			
Particulate emissions, lb/MM Btu									
Year control system installed				1954	1954	1961			
Consumption, coal, TPY	5,114	6,819	2,996	34,328	29,379	50,840			
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF									

Client: [illegible]

Location: [illegible]

Data Sources: April 4, 1975 - APCD - Public hearing

date 1/13/76

Boiler I.D.	1	2	3	4					
Boiler type	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry					
Year installed	1949	1950	1952	1953					
Age	27	26	24	23					
Life remaining, years	13	14	16	17					
Stack height, ft	200	200	200	200					
Stack identification no.	1	1	2	2					
Stack diameter, ft	N/A	N/A	N/A	N/A					
GW output	60	60	60	60					
Capacity factor	67.3	67.3	64.3	64.3					
Operating hours, hours/yr	-	-	-	-					
Tons coal/hr max.	24.5	24.5	36.6	48.5					
Gal. oil/hr max.									
Flue rate, acfm	329,000	329,000	508,000	508,000					
Temperature, °F	245	245	284	284					
CO_2 Dep., lb CO_2/MM Btu	3.2	3.2	3.2	3.2					
Ash content, %	15.3	15.3	15.3	15.3					
Sulfur content, %	2.72	2.72	2.72	2.72					
GPH, Btu/lb coal	10,484	10,452	10,615	10,490					
Btu/gal oil									
Type control particulate	Cyclone	Cyclone	Cyclone	Cyclone					
Efficiency, %	50	50	50	50					
Particulate emissions, lb/MM Btu	5.41	5.41	5.41	5.41					
Year control system installed	1949	1950	1952	1953					
Consumption, coal, TPY									
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF									

PLANT HARRIS

LOCATION Stratton - Jefferson Co.

Data Sources 1974 FPC - 67

Boiler I.D.	1	2	3	4	5	6	7		
Boiler type	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry		
Year installed	1959	1960	1961	1962	1967	1969	1971		
Age	17	16	15	14	9	7	5		
Life remaining, years	23	24	25	26	31	33	35		
Stack height, ft	504	504	504	504	850	850	1,000		
Stack identification no.	1	1	2	2	3	3	4		
Stack diameter, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A		
MW output	185	185	185	185	317.5	623	623		
Capacity factor	61.35	70.48	67.69	67.61	67.72	40.21	49.35		
Operating hours, hours/yr	6940.4	7791.2	7603.9	7777.3	7098.7	4486.7	5750.9		
Tons coal/hr max.	72.5	72.5	72.5	72.5	117.95	234.5	234.5		
Bbl. oil/hr max.	0.9	0.9	0.9	0.9	0.9	0.9	0.9		
Flow rate, acfm	1,079,724	1,079,724	1,079,724	1,079,724	940,114	936,782	1,884,393		
Temperature, °F	269	269	269	269	267	272	272		
SO_2 Reg., lb SO_2/MM Btu									
Ash content, %	16.7	16.7	16.7	16.7	16.7	16.7	16.7		
Sulfur content, %	2.5	2.5	2.5	2.5	2.5	2.5	2.5		
HHV, Btu/lb coal	10,974	10,974	10,974	10,974	10,974	10,974	10,974		
Btu/gal oil									
Type control particulate	ESP	ESP	ESP	ESP	ESP	ESP	ESP		
Efficiency, %	91.3	95	95	95.5	84.2	80	80		
Particulate emissions, lb/MM Btu	0.32	0.32	0.32	0.48	1.42	2.69	2.63		
Year control system installed	1959	1960	1961	1962	1967	1967	1971		
Consumption, coal, TPY	446,500	515,300	508,200	505,000	865,300	1,007,200	1,219,500		
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF									

Plant J. M. STUART

Location Aberdeen - Adams Co.

Data Sources 1974 - FPC - 67

Boiler I.D.	1	2	3	4	Aux.				
Boiler type	Pulv. dry	Pulv. dry	Pulv. dry	Pulv. dry					
Year installed	1971	1970	1972	1974					
Age	5	6	4	2					
Life remaining, years	35	34	36	38					
Stack height, ft	N/A	N/A	N/A	N/A					
Stack identification no.	1	2	3	4					
Stack diameter, ft	N/A	N/A	N/A	N/A					
MW output	610.2	610.2	610.2	610.2					
Capacity factor	56.7	53.5	47.2	32.5	N/A				
Operating hours, hours/yr	7234	6925.7	6111.9	3837.1					
Tons coal/hr max.	250	250	250	250					
Bbl. oil/hr max.	-	-	-	-					
Flue rate, acfm	1,500,000	1,500,000	1,500,000	1,500,000					
Temperature, °F	240	240	240	240					
SO_2 Reg., lb SO_2/MM Btu	2.0	2.0	2.0	2.0					
Ash content, %	19.6	19.6	19.6	19.6					
Sulfur content, %	1.8	1.8	1.8	1.8					
HHV, Btu/lb coal	10,345	10,345	10,345	10,345					
Btu/gal oil	140,000	140,000	140,000	140,000					
Type control particulate	ESP	ESP	ESP	ESP					
Efficiency, %	88.2	84.6	97.0	-					
Particulate emissions, lb/MM Btu	1.44	1.88	0.37	12.23					
Year control system installed	1971	1970	1972	1974					
Consumption, coal, TPY	1,331,300	1,291,600	1,156,000	759,700	-				
Consumption, oil, 1000 bbl/yr	7.6	7.8	8.2	11.7	8.9				
Consumption, gas, 10^6 CF									

Plant: D.P. Hill

Location: Dayton - Montgomery County

Data Sources: 1974 FPC - 67

Boiler I.D.	4	5	7-1	7-2	8-1	8-2			
Boiler type	Wet	Wet	Dry	Dry	Dry	Dry			
Year installed	1950	1959	1937	1937	1940	1940			
Age	18	17	39	39	36	36			
Life remaining, years	22	23	1	1	4	4			
Stack height, ft	307	307	707	307	307	307			
Stack identification no.	3	4	1	1	2	2			
Stack diameter, ft	N/A	N/A	N/A	N/A	N/A	N/A			
MW output	107	147	37.5	37.5	37.5	37.5			
Capacity factor	61.6	62.0	N/A	N/A	N/A	N/A			
Operating hours, hours/yr	6229.4	6765.1	2014.9	1803.7	2269.2	7260.8			
Dens coal/hr max.	94	94	21	21	21	21			
Max. oil/hr max.	-	-	97	97	97	97			
Flue gas, acfm	507,000	505,000	500,000	500,000	500,000	500,000			
Temperature, °F	270	270	410	410	410	410			
SO_2 Emp., lb SO_2/MM Btu	1.6	1.6	1.8	1.8	1.8	1.8			
Ash content, %	17	17	17	17	17	17			
Sulfur content, %	1.0	1.0	1.0	1.0	1.0	1.0			
BTU, Btu/lb coal	10,834	10,834	10,834	10,834	10,834	10,834			
Btu/gal oil	136,000	136,000	136,000	136,000	136,000	136,000			
Type control particulate	ESP	ESP	ESP	ESP	ESP	ESP			
Efficiency, %	91.0	93.2	78.9	67.9					
Particulate emissions, lb/MM Btu	0.9	0.9							
Year control system installed	1950	1959							
Consumption, coal, TPY	202,000	318,200	27,800	19,900	15,500	15,500			
Consumption, oil, 1000 bbl/yr	-	-	2.8	21.0	67.8	63.2			
Consumption, gas, 10^9 CF	44.9	217.9	6.2	6.0	6.2	5.8			

Plant [illegible]

Location Toronto - Jefferson Co.

Data Sources 1974 - FPC - 67

Boiler I.D.	9	10	11						
Boiler type	Pulv. wet	Pulv. dry	Pulv. dry						
Year installed	1940	1949	1949						
Age	36	27	27						
Life remaining, years	4	13	13						
Stack height, ft	650	650	650						
Stack identification no.	12	12	12						
Stack diameter, ft	N/A	N/A	N/A						
GW output	43.75	66	66						
Capacity factor [illegible]ure/yr	5033.5	6270.2	6658.8						
Operating hours,	21.65	36.9	36.9						
Time coal/[illegible]ess.	-	-	-						
Gal. oil, scfm	779,960	779,960	779,960						
Flue[illegible]ature, °F	335	335	335						
SO_2 Reg., lb SO_2/MM Btu	1.4	1.4	1.4						
Ash content, %	18.3	18.3	18.3						
Sulfur [illegible]nt, %	2.9	2.9	2.9						
HHV, [illegible] coal	10,877	10,877	10,877						
[illegible]									
Type [illegible]ticulate	ESP	ESP	ESP						
Efficiency, %	90.8	93.4	94.3						
Particulate emissions, lb/MM Btu	0.14	0.14	0.14						
Year control system installed	1970	1970	1970						
Consumption, coal, TPY	96,700	177,500	198,000						
Consumption, oil, 1000 bbl/yr									
Consumption, gas, 10^6 CF									

PLANT: WOODCOCK

LOCATION: Bluffton - Allen

Data Sources: 1974 FPC - 67

Boiler I.D.	1	2	3	4	5				
Boiler type	Dry	Dry	Dry	Dry	Dry				
Year installed	1938	1938	1941	1947	1950				
Age	38	38	35	29	26				
Life remaining, years	2	2	5	11	14				
Stack height, ft	165	165	165	185	165				
Stack identification no.	1	1	1	2	2				
Stack diameter, ft	N/A	N/A	N/A	N/A	N/A				
MW output	9	9	8	11	11				
Capacity factor	N/A	N/A	N/A	N/A	N/A				
Operating hours, hours/yr	3565	3565	3565	3565	3565				
Tons coal/hr max.	← 75 →			92 →					
Bbl. oil/hr max.									
Flow rate, acfm	125,000	125,000	125,000	190,000	150,000				
Temperature, °F	375	375	375	375	375				
SO_2 Req., lb SO_2/MM Btu	1.6	1.6	1.6	1.6	1.6				
Ash content, %	12.49	12.49	12.49	12.49	12.49				
Sulfur content, %	1.4	1.4	1.4	1.4	1.4				
BTU, Btu/lb coal	12,134	12,134	12,134	12,134	12,134				
Btu/gal oil	137,593	137,593	137,593	137,593	137,593				
Type control particulate	None	None	None	None	Cyclone				
Efficiency, %	0	0	0	0	85				
Particulate emissions, lb/MM Btu	9.59	9.59	9.59	9.59	9.59				
Year control system installed	-	-	-	-	1971				
Consumption, - oil, TPY	← 69,000 →								
Consumption, oil, 1000 bbl/yr	← 13.2 →								
Consumption, gas, 10^6 CF									

APPENDIX B

DESIGN PARAMETERS FOR ESTIMATING FLUE GAS DESULFURIZATION COSTS

NONREGENERABLE WET LIMESTONE SCRUBBING

Limestone System

Unloading hopper: 100 ton capacity

Dead storage pile: 30 day storage

Feeders, conveyors: capacity 5.8 x maximum limestone flow, tons/hr

Live storage silos: 3 (3 days storage)

Ball mills: 2 units, capacity as required

Limestone slurry storage tank: 2 tanks, capacity as required (24 hours storage)

Limestone slurry feed pumps: 2 pumps/train with 1 spare for each 2 operating pumps

Raw water pumps: as required

Clarifiers: as required

Sludge pond: pond as required with 50 foot dike which would cover the remaining life of each plant

Scrubbing System (each train)

Fan: 1-100% unit

Type - Double inlet centrifugal

ΔP = 16.0" H_2O

Absorber: type - TCA with 2 beds

ΔP = 10" H_2O

L/G = 65 GPM/MACFM (inlet gas to absorber scrubber)

Slurry concentration = 8% (wt.)

SO_2 removal = 85%

Gas velocity = 10 FPS, absorber

Circulating tank - 10 minutes retention, absorber

Pumps = 4/train plus 1 spare pump for each train

Entrainment separator: Chevron vane type

Number passes = 2

ΔP = 2" H_2O

Gas velocity = 7 FPS

Reheater: type - indirect tubular

ΔT = 50°F (inlet temperature = 125°F;
outlet temperature = 175°F)

Heating medium - low pressure steam

The design rationale used in this report are listed below:

- The unloading hopper was sized to hold 100 tons in order to accommodate unloading of railroad cars as well as trucks.
- The limestone dead storage pile was sized for 30 days storage to allow the plant to continue operating in the event of an interruption in the supply of limestone. Limestone costs were assumed to remain constant for stack-by-stack and plant-by-plant cases.
- The live storage silos were sized for 3 days storage.
- The feeders and conveyors were sized at 5.8 times the maximum limestone flow to allow the unloading of limestone to take place during a 40 hour week while the plant operates continuously.
- Ball mills were provided and sized to allow the power plant to generate at maximum capacity while burning high sulfur content coal. In the event 1 mill was out of service, the other mill could keep the plant operating for 64 hours.
- The limestone slurry storage tanks were sized for 24 hours storage to allow the scrubbing trains to continue operating for 59 hours with 1 mill out of service or for 24 hours if maintenance required complete shutdown of the 2 ball mills.

- In general, all pumps in the process are provided with spares.

- The clarifiers and a new pond were used with diking to provide sufficient pond space for the life of the plant. The thickener concentrates the effluent slurry from 15% solids to 30% solids and then discharges the 30% effluent slurry to the vacuum filtration units. The effluent leaves the filtration unit with a slurry 60% by weight and then enters a mixing tank where the fixation additives are stirred in with the 60% slurry and then pumped to the sludge pond.

- A UOP* Turbulent Contact Absorber (TCA) was selected for removal of the bulk of the SO_2. This unit has 2 beds of hollow plastic spheres which move randomly between support grids and provide the contact area necessary for mass transfer of SO_2 from the gas to the liquid phase. The absorber is designed for an L/G of 65 GPM/MACFM (inlet gas to the absorber) and a pressure drop of 7" H_2O. Slurry concentration will be 8%; gas velocity in the unit will be 10 FPS; and SO_2 removal is specified to be about 85%.

- Each absorber has a circulating tank sized to provide 10-minute retention time based on the slurry circulating rate. This retention time is essentially the same as that reported by others and should provide sufficient time for desupersaturation and thus reduce scaling potential.

  However, if long retention times are required, the incremental cost would be small since the circulating tanks do not represent large cost items, but space limitations may require locating a secondary tank some distance away and require additional piping.

- The Chevron vane-type entrainment separator was selected to remove mist which is carried over in the gas from the absorber. This unit contains two stages of Chevron vanes which are washed continuously with water. Superficial gas velocity through the unit is 7 FPS and the pressure drop is expected to be about 2" H_2O. Design of the unit is based on information from C-E, Chemico and UOP.

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* Universal Oil Products Company (Air Correction Division).

- The gas leaving the entrainment separator must be reheated to desaturate it and provide buoyancy for adequate atmospheric dispersion. The number of degrees of reheat necessary is variable and dependent on a number of factors such as stack height, local weather conditions, population density, terrain of the area, maximum allowable SO_2 ground-level concentration, etc. For this study, a reheat ΔT of 50°F was used; this is believed to be about the minimum acceptable value. Obviously, the lowest acceptable reheat ΔT should be chosen since each increase of 50°F of the flue gas temperature requires about 1.5% of the gross heat input to the plant.

  An indirect finned tubular heat exchanger was selected for the reheater. The first 33% of the rows of tubes are constructed of Alloy 20 for corrosion resistance to the gas which enters at it's dew point. The remaining 67% of the rows are constructed of carbon steel. Heating medium for the unit is low pressure saturated steam. Pressure drop through the reheater is calculated to be about 4" H_2O.

- Based on experience at an existing installation, a retractable soot blower is used for each 25 ft^2 of scrubber exit duct cross-section for the heat exchanger. Half of the soot blowers will be on the entry side, the remainder on the exit side of the heat exchanger.

- Cost of reheat was based on a coal conversion cost in Btu's.

- Sludge disposal costs are calculated by assuming the sludge will be trucked on a 30 mile round trip.

WELLMAN-LORD SYSTEM

Soda Ash System

Unloading hopper: 100 ton capacity

Storage silo: 3.0 day storage

Feeders: capacity 3.0 x maximum soda ash flow, ton/hr

Na_2CO_3 slurry storage tank: capacity as required (4 hours storage)

Na_2CO_3 slurry feed pump: as required

Raw water pumps: as required

Scrubbing System (each train)

Fan: 1-100% unit

Type - Double inlet centrifugal

ΔP = 16.0" H_2O

Absorber: type - seive tray with 2 stage

ΔP = 8" H_2O

L/G = 3 GPM/MACFM/stage (inlet gas to absorber scrubber)

Slurry concentration = 25% (wt.)

SO_2 removal = 85%

Gas velocity = 8 FPS

Solution storage tanks - 24 hour storage

Pumps = 2/stage plus 1 spare pump for each unit

Entrainment separator: Chevron vane type (2/absorber)

Number passes = 2

ΔP = 2" H_2O

Gas velocity = 7 FPS

Purge treatment:

Refrigeration: temperature 40°F; Flow - 5% of recirculation rate

Centrifuge solids - 5% of stoichiometric Na_2CO_3

Acid plant:

Size: capacity as required (125% of average SO_2 flow)

SO_2 regeneration:

Evaporators: 30% slurry of $NaHSO_3$ based on SO_2 absorbed. Evaporators are sized for one hour retention and 50% free space.

Reboilers: 7.5°F temperature rise; 8 lbs of steam per lb of SO_2

Stripper: overhead is 1 lb SO_2 and 1 lb H_2O for every 1 lb of SO_2

Reheater: type - indirect tubular

ΔT = 50°F (inlet temperature = 125°F; outlet temperature = 175°F)

Heating median - low pressure steam

The design rationale used in this report are listed below:

- The soda ash storage silo was sized for 30 days storage to allow the plant to continue operating in the event of an interruption in the supply of soda ash.
- The feeders were sized at 3.0 times the maximum soda ash flow.
- The soda ash slurry storage tank was sized for 4 hours storage.
- In general, all critical pumps in the process are provided with spares.
- A sieve tray was selected for removal of the bulk of the SO_2. This unit has 2 stages of sieve trays to provide the contact area necessary for mass transfer to SO_2 from the gas to the liquid phase. The absorber is

designed for an L/G of 3 GPM/MACFM/stage (inlet gas to the absorber) and a pressure drop of 8" H_2O. Slurry concentration will be 25%; gas velocity in the unit will be 8 FPS; and SO_2 removal is specified to be about 85%.

- The absorbers have common solution storage tanks sized to provide a 24 hour storage of the slurry. This storage time allows the absorbers to operate for approximately 24 hours in the event the acid plant should breakdown.

- The Chevron vane-type entrainment separator was selected to remove mist which is carried over in the gas from the absorber. This unit contains two stages of Chevron vanes which are washed continuously with water. Superficial gas velocity through the unit is 7 FPS and the pressure drop is expected to be about 2" H_2O. Design of the unit is based on information from C-E, Chemico and UOP.

- The gas leaving the entrainment separator must be reheated to desaturate it and provide buoyancy for adequate atmospheric dispersion. The number of degrees of reheat necessary is variable and dependent on a number of factors such as stack height, local weather conditions, population density, terrain of the area, maximum allowable SO_2 ground-level concentration, etc. For this study, a reheat ΔT of 50°F was used; this is believed to be about the minimum acceptable value. Obviously, the lowest acceptable reheat ΔT should be chosen since each increase of 50°F of the flue gas temperature requires about 1.5% of the gross heat input to the plant.

  An indirect finned tubular heat exchanger was selected for the reheater. The first 33% of the rows of tubes are constructed of Alloy 20 for corrosion resistance to the gas which enters at it's dew point. The remaining 67% of the rows are constructed of carbon steel. Heating medium for the unit is low pressure saturated steam. Pressure drop through the reheater is calculated to be about 4" H_2O.

- Based on experience at an existing facility, a retractable soot blower is used for each 25 ft^2 of scrubber exit duct cross-section for the heat exchanger. Half of the soot blowers will be on the entry side, the remainder on the exit side of the heat exchanger.

- Cost of reheat was based purely on a coal conversion cost in Btu's.

- Purge treatment equipment was based for the most part on TVA cost estimates.

- The acid plant cost was based on costs furnished by Wellman-Lord.

Certain assumptions were made to generate the data specifically requested by the client. Sulfur dioxide emissions were calculated, using AP-42, based on the percent sulfur of the coal, as reported in the data acquisition section of this report. The FGD absorbers were assumed to attain an 85 percent removal of sulfur dioxide. If a specific unit required less than this amount of control, the amount of flue gas treated by the absorbers was adjusted appropriately to reflect the required removal level; the remaining flue gas was assumed to have bypassed the absorbers. The treated and untreated portions of the flue gas then were sent to a stack.

For plants where no information on plant layout was available within the allotted time of this report, a total duct run of 600 feet was assumed and costed as such. Ducting width and height was defined by flue gas volume.

Utility usage figures were tabulated by the FGD computer program on a yearly basis. Although the utility rates were zeroed, the usage figures were still reported and used to compute the fuel and capacity penalties.